The Builder.

No. CXXV.

SATURDAY, JUNE 28, 1845.

THE recent discussions, or rather conversations, in the House of Lords, respecting the new Houses of Parliament, will, it is to be feared, greatly affect the successful execution of the works, and must be regarded with considerable interest by the profession, if not by the public at large. Their lordships, the Peers, it seems, are not conveniently located; their temporary house is found, when they assemble in any number, to be confined and ill-ventilated, to say nothing of its want of grandeur and effect; and they are therefore most anxious, and have been for a long time past, to force forward this portion of the general design, quite irrespective of the other parts. A committee, appointed by their lordships, have from time to time examined Mr. Barry, and Mr. Grissell the contractor, to ascertain the progress made, and have led the former, by their urgency, to promise the completion of their portion of the building earlier than, under the various circumstances which control him, was possible.

"Would it not go on faster," said the committee, "if every man and every stone now employed on the building generally were applied to the House of Lords alone?" And when the architect said "Yes," in reply, they ordered that every man and every stone *should* be so employed. If Mr. Barry had been an older practitioner, and had felt himself sufficiently firm in his position to brave the displeasure of the committee, he would at once have told their lordships that such a proceeding was quite out of the question; that he had other masters to regard, — the Commissioners of Woods and Works, the Commissioners of Fine Arts, the various officers of the Houses, all pressing their several claims; that he had the public to consider, and his own reputation as an artist; moreover, that it was not simply unwise, but impossible. As it was, however, he seems to have allowed the committee to consider that their instruction would be complied with, and was induced, under pressure, to name an earlier date for the completion of the House of Lords than he should have done.

As regards the general progress of the works, the most casual examination of the structure, with due consideration of the elaborate nature of the carved decorations, unexampled in modern days, will serve to shew that no time has been lost or efforts spared. It is now four years since Grissell and Peto laid the first stone (the foundations being already formed),—what are four years for such an undertaking?—and from that time to this 400 men have been constantly employed *on the ground*, with many more in preparing elsewhere, and have never been kept waiting by the architect.

Some persons think, if we may use the word where no thought is really given, that when an architect has produced the design for a building his work is over, and that it may, without further thought, be forthwith carried out. Nothing is more erroneous, especially as regards Gothic architecture: it is then that the architect's labour commences, and his skill is proved. In such a work as the Houses of Parliament, every superficial yard demands the closest thought, and requires as many detailed drawings as for the whole of an ordinary dwelling-house. Every ornament, every moulding, every line, must be produced and delineated; and over all these does Mr. Barry's own pencil pass. An architect careless of his reputation may get through any amount of work, *by deputy;* but if determined to execute it to the best of his power, strive as he may, he can only produce a certain quantity, and we will venture to say that the architect of the new Houses of Parliament finds little time for other occupations or recreation from early on Monday morning till late on Saturday night. The wear and tear must be immense.

The life of an architect even under favourable circumstances is one of toil and anxiety; and he needs to have no extraneous circumstances to harass and perplex him. We have heard a member of the lower House declare his ability to write poetry by the mile; we may probably find one of the upper House profess the power to design gothic details by the acre, and laugh at the idea of limits to a man's power in so simple a matter. They would be equally entitled to credence: we should merely say they were exceptions from the general rule.

In judging of the asserted delay, which, according to Lord Brougham, has given Mr. Barry the name of delay (as Quintilian said of Tully, that he was not only an orator, but the name of eloquence), the public should bear in mind that the river front which they see is only one-third of the whole structure, much of which they cannot see. The buildings altogether cover eleven acres, and their cubical contents have been estimated at half as much more than the contents of St. Paul's Cathedral, which occupied about five and thirty years in building, without any material interruptions. They should also know that the whole building is made fire-proof, and that the difficulty of combining this with Dr. Reid's extraordinary arrangements for ventilating the structure and taking off the smoke, has been immense. Over these latter the architect has up to this time had no control; but so much delay and inconvenience has been caused by them that a rupture has occurred, and it now rests with the ruling powers to establish the supremacy of one party or the other. We do not wish ourselves to throw any blame on Dr. Reid; the whole is an experiment, and its magnitude is so great as necessarily to demand much deliberation, but it is too bad that an architect's operations should be suspended, his designs altered, and his views interfered with; and then that he should be blamed for what has been done against his will. The work in the lobby of the House of Lords was delayed six whole months because the system of ventilation there was not determined on.

The Peers now insist on having their house ready for occupation in February next, and the greatest efforts are consequently being made. All the walls and the ceiling are to be covered with carved wood-work of the most elaborate character, and this is being forced on by 150 additional workmen much more rapidly than is desirable. It will probably be ready for fixing about October, and instead of remaining as it should do in the drying rooms during the winter ready for fixing in the summer, will be taken into the new building in the bad weather, and probably be irreparably injured. Do what they will, moreover, the House of Lords *cannot be completed by the time named*, nor is it desirable that it should be. Surely, if their lordships would consider that this building is not simply for some immediate or temporary purpose, but is intended to last for ages, and that the great object should be not to do it quickly but well, they would restrain their impatience and allow the architect to work out efficiently the whole design. If the present accommodation is bad, let it be made better; re-construct the temporary House of Lords during the ensuing vacation, and persuade them to put up with the indignity yet a little longer, so that their order may be worthily lodged ever after. The architects of the middle ages produced the noble works to which we now appeal with pride, slowly, by degrees, and as works of love; at least let us give the nineteenth century one chance, and not by unnecessary and child-like haste, risk adding another failure to the crowd which already disgrace it.

ILLUSTRATIONS OF ARCHITECTURE FROM THE BRITISH MUSEUM.

THE XANTHIAN MARBLES.

We have directed attention, in previous numbers of The Builder, to the want of a museum for British antiquities, and those of the middle ages generally. But if we mention the continued want in this particular, it is right to recollect, that excellent provision is made, at least, for the antiquities of the ancients. The general arrangements of the British Museum are conducted on a scale of munificence, productive of the greatest benefits to all classes. The collection has become so extensive, that it is quite impossible to be acquainted with all the treasures it contains, even in one particular line of study, whilst the most valuable fragments can never be examined without suggesting fresh points for inquiry. It will be our object in some future numbers of this journal to direct the attention of the architect, and the decorative artist, to such portions of the collection as bear upon their peculiar pursuits. The art of sculpture occupies a large space, but most of the examples are equally interesting to the architect, and afford even the forms of the furniture, and of many utensils of the ancients. Lately the collection in the Elgin room has been enriched with casts from some remaining portions of the Parthenon. Amongst these is the sacred owl of Minerva. There is also a cast of the capital, from the monument of Lysicrates. No one can examine the figures from the temple, which are at present deposited in the Museum, without wonder at the careful execution in objects so far removed from the spectator; but the wonder is greatly increased on finding from the work of Revett and Stuart, that the Elgin marbles form a very small part of those formerly existing. This may also be seen on referring to a restoration of the pediment, or to the large models of the temple in its present, and its original state, now constructing in the Elgin room. But the most important acquisition, which the Museum has received, since the Phigalian frieze, is that of the Xanthian marbles. These have previously been described, but their architectural interest leads us again to refer to them.

The country of Asia Minor occupied an important position in the ancient world, and one strongly contrasted with its present state, regarding which there is still great want of information. Few have contributed more to a knowledge of its ancient state than Mr., now Sir Charles Fellows, to whom we are indebted for the transmission of the Xanthian marbles to England, and who has published two journals of his visits, and an account of the proceedings at the ancient city. The tombs of Asia Minor are probably as curious as the receptacles for the dead in any country, not only from their immense number, but their forms and workmanship. Whilst the character of their sculptures proves many of them to have been of the best age of Greek art, their architectural character is often singular and unintelligible. There are among them, not only isolated constructions, but also, and perhaps in greater number, excavations like the Roman tombs of Petra. Many of them shew a closer similarity to timber construction, than is observable in the Doric temple of the European

Greeks, and in fact they resemble the huts of the present inhabitants of the country. This is observable in a fragment carved in imitation of the cross poles, projecting from the eaves of the hut. A roof having its section in the form of a gothic arch is common. Many of the monuments are each nothing more than the frustum of an obelisk, with a few large fillets as cornice. The monument called the "Harpy Tomb," of which there is a model in the Museum, was of this form, and it was decorated with the sculptures, supposed to represent the story of the Harpies flying away with the daughters of King Pandarus. But the most interesting monument is one erected to commemorate the conquest of Xanthus by Harpagus, the general of Cyrus, in B.C. 546, as described in Herodotus, book i.* When discovered it was a mass of ruins, but has lately been restored in a model, placed in the Museum. This trophy consists of a lofty basement, supporting a peristyle. The former was surrounded at the foot, and beneath the cornice, by the bas-reliefs,—representing the siege of a walled town, and a contest of horse and foot combatants,—which are at present in the collection. The edges of these portions shew the contrivance for procuring a perfect joint; the meeting surfaces are perfectly smooth for the breadth of an inch at the front, but within are left rough for the mortar. The perfect cohesion obtained was equally favourable to the stability of the mass, and the beauty of the work; indeed the joints were sometimes so close that a knife could not be inserted, and it has even been asserted, that many of the Greek temples were constructed entirely without mortar. The cornice of the basement, in the monument under consideration, is curious from its two ovolos, which are placed one immediately above the other; they are enriched, and have beneath them an enriched bead, the whole being decidedly of Grecian workmanship. The top bed of this cornice shews the position of the column of the peristyle which was fastened into the block, probably by a copper plug. It is, however, certain, that a wooden pin was often employed, and one of these was lately presented to the Institute of Architects by Mr. Hamilton. The peristyle has fourteen fluted columns of the Ionic order, supporting a pedimental roof, and inclosing a small "cella," which, however, appears from the *model* to have been built solid. The porticos are tetrastyle, and the intercolumniation areostyle. The bases are peculiar from their extreme height. They have the reeded torus, as in the Erectheum, and beneath it two hollows separated by beads; but the hollows are not like the scotia of the attic base, and, as in Grecian examples, there is no plinth. The frieze is ornamented with sculpture, as are the pediments, and also the frieze of the cella. Parts of these friezes represent the guests seated at a banquet, probably the carousal after the victory. The angles and apex of the pediments have figures in motion, and there are also figures of men and animals in the intercolumns of the peristyle. The antæ of the *cella* have very beautiful capitals enriched with pateras, and waterleaves; and are, as in most Greek examples, of less breadth in flank than in front. The order has no architrave; the only moulding beneath the frieze being similar to the tænia in the Doric order. The pieces of the entablature were bound together by copper cramps (▬ this form), run with lead, as may still be observed. The crowning member of the pediment (*sima*) has been continued along the flanks and ornamented with lions' heads, being in this respect like the Roman system; the Greeks were in the habit of stopping it at a short distance from the front. The dentils are unusually large, and the slabs of the roof covering in the model are also extremely large; is there authority for these peculiarities in a building so essentially Greek?

The greatest interest cannot but be felt in the examination of these remains,—their beautiful workmanship, the fine treatment of the sculptured decorations, place them as second only to the finer works from the Parthenon. They were produced in a country, which had greater influence upon other nations than any other, Athens not excepted. Asia Minor was the nurse of Grecian philosophy and art, and it is melancholy to reflect upon its present debasement.

E. H.

* See BUILDER, page 63, *ante*.

ON THE SHAPE OF HOUSE DRAINS.

SIR,—Having some time since recommended, through the medium of THE BUILDER (pages 593 and 606, vol. ii.), that in the construction of *house drains* it would be extremely desirable to employ good, strong, and well-burnt cylindrical pipes, made of clay, and glazed inside, in lieu of the present method of building them, both cylindrically and rectangularly of common bricks, I cannot but regret that you in your judgment of this matter should have thought it desirable to have somewhat suggested in answer to your correspondent, "A Bricklayer," last week, that the construction of house drains might be of a rectangular or square angled shape; and that they might be thus built of certain sizes equal to a circular area of 9 inches diameter, in order to comply with a clause to that effect in the New Buildings Act.*

In this age of improvement it is highly desirable to promote and enlarge the adoption of scientific principles as much as possible, because the more we have recourse and conform to such principles the more certain and correct will all subjects to which they are applied, be in their results; and upon no subjects, and in no case, are the principles of science more applicable, and more required, than to the improvement and correction of the false principles of drainage. It appears to me that a very great error was committed in framing the clause in question, by leaving the forms, sizes, and construction of house drains so undefined; and also in not declaring at once that for the future all drains should be made of a cylindrical shape, or that their bottoms should be made concave or semicircular, and as even and uniform as possible.

The arrangement and construction of house-drains may seem, and no doubt it is to many builders, a very trifling and worthless affair; their formation being considered of very little consequence, and indeed the manner in which they are generally executed proves this statement to be a fact. No parts of a building require more attention, and more nicety in producing perfection in arrangement and construction than should be observed in the building of house drains. It is by the means of proper and efficient drains that animal and vegetable filth engendered in dwelling houses is usually carried off; and the discharge of this becomes the more certain and perfect according to the pains taken in producing accuracy of form, size, arrangement, and construction of the drains. The building of drains is a subject of great and *serious* consequence, in reference to the effect they are calculated to produce on the health of the inhabitants of dwelling-houses, and, therefore, their utility and efficacy are of the utmost importance to the sanatory condition of the population. The valuable evidence which has been elicited by the inquiries of the Health of Towns Commission, with reference to the subject of drainage, and the impetus that has recently been given to the propriety of providing good and perfect drainage in places where none exists at present, and the agitation which has resulted from its publicity, has had, in a great measure, the desirable and salutary effect of arousing the attention of the public mind to the evil effects of bad, and the necessity and great importance of good and efficient drainage of dwelling-houses. So far as the metropolis is concerned, the New Buildings Act has provided, and that very considerably, for the extension of drainage, by obliging persons to build sewers in front of, and to lay drains into them from all houses that shall hereafter be built, if there be any sewer or open watercourse under the jurisdiction of any of the Metropolitan Commissions of Sewers within 100 feet of such intended new buildings. This is certainly one grand and excellent step towards providing for the extension of house-drainage; but this Act does not provide for the formation of sewers in populated districts where none now exist, nor for obliging persons to build sewers for the drainage of premises or new districts. If the points where sewers have already been carried up, and which are hidden and buried, and the water courses and other places, under the jurisdiction of the various commissions of sewers, be narrowly and strictly watched by the district surveyors, all or most of these points may fall within the distance stipulated by the Act, namely, 100 feet from the intended buildings; and were these points known and properly defined they could be made subservient to the extension of drainage. I think it would be a good and desirable plan to ascertain and mark all these various places and points on a good-sized map for the use and reference of these gentlemen; as otherwise buildings may be allowed to be carried up without any, or an improper drainage, from the surveyors not being properly acquainted with these particulars.

The employment of common bricks in the construction of drains, and especially drains of rectangular formation, cannot be too highly reprobated. Drains of rectangular construction are not only calculated not to afford a powerful resistance to the pressure of the ground which is filled in around them, and therefore are liable from this cause to disarrangement and destruction, but such a form is also contrary to hydraulic principles, as the energy, action, and power of the streams in lifting and carrying along substances in suspension with it, is materially retarded and destroyed by such a form and arrangement, as might very easily be proved. The means of carrying off the animal and vegetable matter from dwellings is entirely dependant upon the quantity and power of the water which passes into the drains; and the mechanical action and power of the water may be rendered altogether inefficacious for this purpose by the sluggishness of their falls, their sizes, and their forms. It is really surprising to observe how persons go on from day to day, and from year to year, forming these things, when they are known to be exceedingly bad in principle and inefficient in action, because such formations have become a business of habit; and also, as is too often evinced, from a stubbornness against introducing improvements. The use of pipes in the construction of drains is rendered the more necessary in consequence of the notorious carelessness of bricklayers in building brick drains; for let it be taken as an *axiom* that whenever a bricklayer has to execute a piece of work which is to be immediately covered over and hidden, without being watched, the chances are that he is sure to perform it in an unsound, slovenly, and improper manner. I have often observed drains being laid through houses in the following manner: two parallel lines of two or three courses of bricks were laid flat, or on edge upon one another, and at about seven inches apart, and sometimes without any mortar; no other bottom or channel being formed or provided for the passage of fluids and substances along them, than what was afforded by merely the *bare earth*. And yet no means are available in preventing such reckless and abominable proceedings.

Of all the routine of construction in buildings, the arrangement of the proper sizes and falls which drains should be of, and their construction as well, are least cared for, and less thought of; so long as there be an aperture and channel formed, whether it be multangular, rectangular, or however various its form may be, it is considered sufficient to answer the purpose; indeed, this too is notorious, and can be proved to the satisfaction of any one if he will only take the trouble to examine their interior constructions. The interiors of drains are usually parts of a building which are unseen; indeed, this is actually the case even during the time of their execution; and the best and only manner of properly observing their state and the way in which they have been built, is by examining their insides from the interior of a sewer; and as this mode of examination does not fall to the lot of but very few persons, I take leave to say that, when thus observed, their appearances are truly abominable. From the improper and imperfect manner in which the brickwork is usually performed, and the bad way in which the ground is filled in around them, the drains are invariably squeezed and crushed into all manner of shapes and sizes; and sometimes while building, their interiors are left half full of either brick rubbish, clay, or gravel, which lays upon their bottoms so long as the drains exist, or till they become entirely choked by the deposition and accumulation of matter, and

* The remark to which our correspondent refers was made simply to explain the meaning of a clause in the Buildings Act, and to shew what *might* be used, and had no reference whatever to the best form.

are cleared out. Besides, the bottom halves of brick drains are usually laid dry on the ground without mortar or cement, and the consequence is that the greater part of the fluid which passes into them percolates through the joints of the bricks and is absorbed by the subsoil, and from this cause a drain cannot be considered otherwise than as a long and narrow line of cesspool. From the uneven manner in which the bricks are usually laid along the bottoms, and from the rubbish and pieces of mortar that are left within them as well, these protrusions present a succession of internal irregularities and stoppages; so that at every inch or so along the bottom and sides, the water, and animal and vegetable matter which is carried along in suspension with it, becomes arrested in its progress to the sewer; and consequently the soil becomes deposited upon the bottoms of the drains, and these, from this and other circumstances before referred to, ultimately become choked, and are thus rendered of no utility and service whatever in assisting the discharge of the sulliage through them to the sewer. During the time the matter is collecting within the drains, and this may be going on for months together, the inhabitants are very much annoyed, and incessantly complain of foul vapours and stench, which emanate from the decomposition and fermentation of the accumulated matter through the various vents within and about the houses, and effluvia of the most filthy, noisome, and malignant description, are inhaled by them. It has very often been shewn clearly and forcibly that wherever bad drainage exists the surrounding atmosphere becomes vitiated and charged with malaria and poisonous gases, which have a most injurious effect upon the health of all those persons who reside in such places, and, very often, these gases are the cause of the production of virulent fevers. The use and abuse of cesspools have very often been spoken of, but I really cannot see what difference there can be between a cesspool, and a long line of ill-constructed drain, which runs under a house, and retains all, or nearly all, the filth which is discharged into it, and has to be cleared out periodically, precisely the same as a cesspool.

If drains are to be made at all, the workmanship should be made as clean, smooth, and perfect as possible, otherwise a cesspool is nearly as effectual: and it is only a waste of time and money in building drains without particular attention be observed in these points, and also in making them so as to prevent foul air and fluids from escaping through them. I have seen the interiors of tube drains whose calibre is exceedingly small, and have been in use many years, perfectly free and clear from deposits and accumulations, while the bottoms of large brick drains contiguous, were half-filled with deposited matter; their size and roughness causing the matter to lodge within them.

To all persons who are any way engaged in the formation of drains a knowledge of the scientific principles of statics and hydraulics is highly desirable; indeed, no drainage could be *properly* laid down and conducted without this knowledge and the dependance and manner of applying these principles to it. The proper and efficient drainage of a very great many houses in all parts of the metropolis are rendered altogether ineffectual from the circumstance of the bad and improper construction of their drains; and the facilities afforded by the sewers in carrying off the sulliage are by this means of little or no avail. And the improvements which are yearly taking place in the metropolis by deepening and reconstructing the sewers, and otherwise affording good, efficient, and permanent drainage of premises, are in very many instances of no service, because no control is allowed to be exercised over the manner of forming and constructing private house-drains. It may appear somewhat difficult to legislate for the arrangement and construction of private drains, but most assuredly considerations and difficulties ought not to have any weight when it is observed that the building of a private drain and a sewer are so mixed up and blended together that the efficiency of both are rendered reciprocal, and are thus materially dependant upon their proper falls and constructions; for whenever the one is badly arranged in these respects the other is rendered almost useless in consequence. I have very often been applied to and asked where the drain pipes in straight lengths and curved junctions, and of the description and strength which I have suggested could be procured. But from not knowing where such are to be obtained, if at all, I have not been able to give a direction, and thus recommend, and ensure their actual application to practice.

From the great impetus that is expected to be given to the manufacture of glass, in consequence of the repeal of the duty, I see no reason why cylindrical drain pipes of various diameters should not be made of glass, as such a form, and the smoothness of this material would afford facilities in accelerating the discharge of the drainage of houses into the sewers, that no other material could so well do. There is no question but that they could be made of sufficient substance and strength to enable them to resist very great pressures; and that they could be made with proper joints, and in lengths both curved and straight, with proper curved collateral junctions, convenient for using. The interiors of drains cannot be too smooth, for smoothness of surface and proper falls and sizes are the principal points to be observed in their construction. Good, thick, well-burnt cylindrical drain-pipes were very much in use in England about a century and a half ago, for I have seen and taken up many that were laid down about that time; and with all the boasted science and skill which has of late been shewn on the subject of drainage and sewerage, we are still considerably behind hand with what was done and generally practised by the Romans, especially in the drainage of their villas. This people used pipes of earth very extensively, both in the conveyance of water from springs and aqueducts to their houses, as well as in carrying off the drainage therefrom into the main sewers.

Whatever may be said in reference to the subject of tubular drains, it can have no other effect than of promulgating their efficiency, and of clearing the way for their use. As for the originality of proposing tubes for drains, it would be the height of absurdity and plagiarism in me to claim it, for what Pliny says in his natural history on the subject of drain-pipes would appear to set this matter at rest. He says that "If a man would convey water from any head of a spring, the best way is to use *pipes of earth* made by potter's art; and the same ought to be *two fingers thick*, and one jointed within another, so as the end of the upper pipes enter into the nether, as a tenon into a mortaise, or as a box into the lid: the same ought to be united and laid even with quicklime quenched and dissolved in oile." And he says further that "the skill and knowledge of pottery is more antient than founderie or casting brasse;" and again "how beneficial is the earth unto us in yeelding us *conduit pipes* for to convey water into our bains."* Now, whether any one else can lay claim to anticipation, invention, or originality in proposing the use of conduit or drainage pipes after this, I leave to competent and impartial judges to say. I hope, Mr. Editor, you will take every opportunity of recommending the employment of proper cylindrical tubes for the construction of drains, instead of the present mode of building them with bricks, so that by these means better drainage from houses may be produced, which must tend very much to sanatory improvement. Drains should never be constructed of a rectangular form, but should always be made circular, at least their bottoms should where the water runs; for if I take a barrel drain say of 9 inches diameter, its area is equal to 63·617 inches; and the side of a square drain having the same area is equal to 7·976 inches: therefore, now supposing that the quantity of water running through each of these drains to be equal and half full, then the semi-circumference being equal to 14·137 inches, the length of the base of the square added to half its height on each side is equal to 15·952 inches, or nearly 2 inches more. So that we have an actual retardation and loss of power in the stream through friction of nearly 2 inches by using the rectangular drain. And this is not the only loss of power in the stream, for the depth of the water in the square drain is less than that in the circular one by more than half an inch, for in the former the depth is equal to 3·963 inches, and in the latter it is equal to 4·5 inches, the difference being equal to ·537 of an inch. The hydraulic mean depth of each can be found by dividing the transverse area of the water expressed in square inches by the border of the section minus the upper surface of the water. We have a considerable loss of power in several ways by adopting a rectangular shape for a drain, therefore their use should be entirely abandoned; and I think no drains can be better formed, or can afford means of better and more effectually carrying off the animal and vegetable refuse from dwelling-houses than can be done by smooth cylindrical tubes. This letter has run out to a length that I originally did not contemplate, but the magnitude and importance of the subject must be its excuse.

I am, Sir, &c.
JOHN PHILLIPS.

* Pliny's "Natural History," translated by Philemon Holland, 1634.

THE BRITISH ARCHÆOLOGICAL SOCIETIES.

WE continue to receive many letters relative to the dissension, the majority of which urge that members really anxious to effect a junction, should publicly pledge themselves not to attend either meeting at Winchester unless some arrangement be previously made. One gentleman, who signs himself "E. N.," says:—

"SIR,—Your very excellent observations from first to last relative to the Archæological Association are so very suitable to the occasion, and have so much enlisted my sympathies, that I beg to submit to you the question, whether the best mode of bringing the petty squabble to an end would not be for the nominal members to desire their names to be erased from the list; for my own part I thought it so discreditable to remain connected with a society so divided, that I have requested the secretary of each party to erase mine. It must be much regretted by every one who values antiquity, that from want of a business-like constitution the advantages that might have resulted from the co-operation of so many able antiquarians have been prevented."

Mr. Wansey, F.S.A., has addressed to us the following letter, which has also appeared in other journals:—

"Lamenting as we all must the dissensions which exist amongst us to our discomfort, injury, and reproach, I have been hoping some influential members would have come forward publicly to try and heal them. Anxious for the well-being of our association, I respectfully recommend,—that we stop not to inquire who is right or wrong; two rival societies together cannot be for good, and one is tempted to say 'a plague on both your houses:' while the world will jeer, and cry out, '*Tantæne animis cælestibus iræ?*'

Suppose both dissolve, and men the most considerable amongst us for character and station undertake to draw up laws to be submitted to a general meeting, for the government of one new society, embracing all, to be then constituted: officers, &c., to be chosen as usual. I see no better way of getting out of our present undesirable position, and take this mode of addressing you, as the most practicable.

Arborfield, near Reading,
June 19, 1845."

We have the names of more than a dozen influential members who would willingly aid in restoring unanimity. It is said to be common in one part of India when there is any dissension between church and state, for a man to go to the top of a certain pagoda, and vow that if the quarrel be not terminated in twenty-four hours that he will return and throw himself off; and they further relate, that sooner than have the blood of the man upon their heads, both sides usually yield a little, and so the difference is adjusted. Can we not find some devoted friend to peace and quiet to try this move on Westminster Abbey, and thus literally, precipitate an amicable result? If it succeeded, we should claim a daily allowance of milk and honey fore the rest of the year.

THE OFFICIAL REFEREES.—Mr. Higgins has resigned the office of referee under the Buildings Act.

ST. MARY'S MARYLEBONE AND PADDINGTON HOSPITAL.

SIR,—As one of the three architects mentioned in the paragraph respecting "The New Paddington Hospital" in last Saturday's BUILDER, I beg to say that the passage in question does not convey a correct impression of the state of the case. Mr. Hopper is the "Honorary Architect" of St. Mary's Hospital, the committee having thankfully accepted the offer of that gentleman's valuable gratuitous services in aid of the charity. Mr. Lang and myself, as members of the committee, having also placed our professional assistance at the disposal of the committee, were requested to take part in a *friendly* contribution of plans with Mr. Hopper, in order that the committee might not be restricted in their choice to one set of plans, they having determined (wisely in my opinion) that no competition for the employment of the architect should take place, whereby they would have been deprived of Mr. Hopper's services, and would have exposed themselves to all the heart-burnings, jealousies, suspicions of favouritism, and other unpleasant results usually attendant on competitions. Mr. Hopper's plan was unanimously preferred, and even then, with the kind consideration he has always shewn towards his juniors in the profession, that gentleman suggested that Mr. Lang and myself should be allowed to produce elevations to his plan, which was accordingly done, but the committee not feeling at liberty to expend their funds upon mere decoration, resolved to adhere to the design submitted by Mr. Hopper which is of a plain character (in accordance with his own stipulation upon accepting the office of honorary architect), but thoroughly suited to the purpose, and which it is expected will be effective from its very simplicity of design and breadth of proportion.

Thus it will be seen that there never was any intention to compete (as might be inferred from the paragraph in question), among the three parties named, for the situation of architect to the charity, consequently there could be no "wavering in the choice," when there was no choice to be made; and whilst I will always maintain my own right when assailed, I will equally disclaim any attempt to give to me or to any other party that position which justly belongs to another. Having from the first supported the propriety of the charity availing itself of Mr. Hopper's services, I have felt it to be a pleasure as well as a duty to render him all the assistance in my power, in sharing his labour and anxiety to promote the interests of the charity, in carrying out the contemplated building for the hospital.

GEORGE RUSSELL FRENCH.

18, Sussex-gardens, 23rd June, 1845.

LIGHTHOUSE ON THE GODWIN.

Mr. BUSH after having surmounted every obstacle in the erection of the building to contain the "light for all nations," is now contending with the greatest difficulty, namely, its useful application. The Trinity Board has the exclusive privilege of managing the lighthouses on the English coast, and although this privilege was originally granted for the public good, it has now, like many more, become subservient to private interests. The elder brethren are jealous of their rights, they cannot brook the intrusion of a bold, persevering and clever man succeeding where they have failed, and they appear more disposed to visit the offending party with their displeasure than to hail the success of the undertaking, and to reward the skilful engineer for the additional protection he offers to the lives and property of our merchants and seamen. We understand that it is the intention of Mr. Bush to take up his residence, with his wife and family, in the lighthouse, and to have the highest chamber illuminated with a pale blue light for his own use. Of course, however, this will at the same time have the effect of warning ships, and a telegraph is erected to signalize vessels at the back of the Godwin. As the lighthouse stands 36 feet above high-water mark, it is Mr. Bush's intention, in order to protect his new residence, to discharge rockets in dark nights, or sound a gong in foggy weather.

TOURNAY AND ITS CATHEDRAL.

TOURNAY, lately visited by the French Archæological Congress, as mentioned in the last number of THE BUILDER, is situated close to the French frontier, towards the western extremity of Belgium, and is a singularly interesting old town. It was one of the first places in Belgic Gaul where Christianity developed itself, and has a long and curious history. The architectural student will find there much to engage his attention and stimulate investigation. Within a very short distance of each other he may find specimens of the different styles of building which prevailed during several centuries, and see almost at a glance the progression of the changes which took place: I allude more particularly to dwelling-houses. There is one very ancient specimen near the church of St. Brixe. The whole is of stone, and terminates in a gable. The windows, about five feet high and four feet wide, are each divided into two openings by a small column with plain leafed capital. One of the lower windows has simply a rectangular mullion down the centre, the edges of which are chamfered to within a certain distance from the top and bottom. The string courses, consisting merely of a square member and a hollow, continue through the whole front, and form straight window heads, over which are introduced discharging arches. The adjoining front is precisely similar. In the Rue des Jesuits there are some houses of the same character, but of a somewhat more advanced period. The columns and caps are nearly the same as those before mentioned, and the upper part, perhaps 50 or 60 feet in extent, consists wholly of windows and small piers alternately.

An early advance upon this arrangement would probably be the introduction of a transom to divide the windows into four, and so to form a *croisée*. A house near the Grand Place of Tournay affords a very perfect example of the application of pointed architecture to a street front, at the beginning of the 16th century; and near the Eglise de Château is a large building, now the Horse Infirmary for the artillery, which would seem to be an example at a later stage of the decline. It is constructed of red brick and stone, and presents gables, pointed headed windows, other square windows divided by mullions, and large dormers in the roof. The mouldings, however, are Italianized, the discharging arches, partly stone and partly brick, which occur even over the pointed headed openings, are made into adornments, and all the ornaments which appear are of mixed design. Later still, the line of the gable became altered into a scroll, the mullions of the windows disappeared, and the Gothic panelling on the face of the building gave place to pilasters and entablatures elaborately adorned with figures, fruit, and foliage, as may be seen in numberless examples remaining in most of the towns.*

Some of the churches are exceedingly interesting, but the great point of attraction is the cathedral (*Nôtre Dame de Tournai*), which is unquestionably one of the most important buildings in the country, whether regarded simply as a specimen of the architectural skill of two different periods of time, or as recalling by association the events of many centuries,— a sublime *souvenir* of the middle ages.

Seen from a distance, with its forest of towers high above the surrounding buildings, its effect is very striking; nor are the pleasant anticipations so raised in any degree lessened by a close approach. In form, it is a Latin cross, with five towers; namely, one on the east and one on the west side at each end of the transept, and one at the centre of the cross. The transept is terminated at each end by a semicircular absis, similar to many churches in Cologne and other parts of Germany. The nave has an aisle on each side, separated by piers and small columns bearing semicircular arches, which in various parts approach the horse-shoe form.† Above these, is a second range of piers and arches of similar or greater height than the first, forming the front of a large gallery, extending the width of the aisles.* Over these is a series of arches against the wall, springing from short piers. The clerestory and the vaulted ceiling were the work of barbarous repairers in 1777, and took the place of the ancient wooden roof: they will shortly be restored to their original appearance.†

All the capitals of the lower columns in the nave are sculptured to represent foliage, and are exceedingly sharp and clear. In earlier times, they were all painted and gilt, and further decorated by scripture mottoes around the abacus. Much of the stone-work is rough and has been covered with stucco: the columns and other parts that were exposed, are of Tournay stone polished.

The four great arches at the junction of the cross are pointed, and have also been embellished by colour, much of which is still visible.

The interior of the semicircular absis, terminating the transept at either end, is exceedingly beautiful, and produces a very striking effect. At the bottom a series of six lofty columns 2 feet 8 inches diameter, and about 24 feet high, built up of ten courses of stone, and placed at a short distance from the wall of the absis, support narrow semicircular arches raised on legs. Over these are two triforia and a clerestory, and the whole terminates in a half dome with plain ribs converging to a point.‡ The capitals of the columns consist of volutes and of leaves. The base of each pillar has four sculptured leaves at the angles of the pedestal.

Originally the choir was about one-third the length of the building, and terminated in an absis similar to those of the transept in form and style. This portion of the building, however, was rebuilt, as is mentioned hereafter, and is now an exceedingly fine specimen of the pointed style, resembling in some respects the choir of Cologne Cathedral, although executed much before that wonderful building.

The present choir has an aisle and a series of small chapels on both sides, which continue round the east end. Lofty columns, bearing acutely pointed arches, separate the aisles from the choir. In each spandril of these arches is a circular ornament in mosaic work, and above rise a very elegant triforium and lofty clerestory. Behind the triforium is a series of peculiar quatrefoil lights, blocked up and unknown until lately (as indeed was the whole of the triforium), but now again filled with stained glass.

The choir is elevated above the nave by three steps for about one-third its extent, and then by a fourth for the remainder of the length, and is paved by black and white marble in squares. The high altar has four additional steps. The pillars in the choir were originally constructed with that daring which characterizes many of the earlier efforts of pointed architecture, and soon gave symptoms of insufficiency. They were then strengthened by additional masonry at the back, and even now are remarkable for their lightness and elegance. It may be mentioned that when the choir was rebuilt, the old chancel arch, which was probably semicircular, was cut away to make room for a pointed arch, as also was the case at the entrance from the transept to the aisle of the choir on each side. Painting and gilding have been used throughout as a means of decoration, and will probably be again resorted to when the whole of the substantial repairs have been executed.§ A series of flying buttresses surround the choir externally, and it is between these that the chapels are formed, terminating in gables.‖ The roof of the choir above the vaulting is of oak, and of great height.

Round the outside of the clerestory of the

* Lille, a French town, but close to the Belgic frontier, and where the congress met, displays a great number of houses of this character, of great richness, and, in some cases, much beauty.

† The piers occupy a square of 6 feet on the plan, set diagonally. The openings are 13 feet 6 inches wide, and about 11 feet 6 inches high to the springing of the arch. There are nine such compartments on each side of the nave.

* The galleries in ancient churches were used for the purpose of separating the sexes, and even different ages of the same sex. This was perhaps rendered necessary by the custom of *saluting*, which then obtained amongst the "faithful."

† During the whole of the eighteenth century continued injury was done to the building by injudicious endeavours to support the fabric; many openings, especially in the transept and the clerestory of the choir, were bricked up; the capitals of the columns and other decorative portions were covered with whitewash, and the frescoes which adorned the walls destroyed.

‡ These vaults are formed of rubble work, under a wooden roof, and are less than two feet in thickness.

§ In a chapel, south side of the choir, the spandrils of an arcade are painted to represent angels bearing scrolls.

‖ These flying buttresses are double. The upper arch was apparently formed first, and this being found insufficient, the lower arch was then added.

nave there is a continuous gallery, formed within the thickness of the walls, and faced by small octagon columns and arches of the Tournay stone, originally polished.* Elsewhere there are various galleries in the walls, so that all parts of the building are practicable.

The same stone is employed in the construction of the building as the rock consists of on which it stands, so that it may be said to be a continuation of the solid substratum. Nevertheless, there are many very serious fissures and settlements, especially in the transept and choir, which need extensive repair. The west front of the building has been disfigured by various alterations; a groined porch in the pointed style extends the whole length of the front, and above it a large pointed window has been introduced so as to destroy entirely its original character.† There is a variety of sculpture under the porch, but the greater part of it is modern and very uninteresting. The cathedral is entered by two doors, one on the north side of the nave, and the other on the south, adjoining the transept. The north door is of the transition period. It consists of a semicircular archway beneath a pointed trefoil arch, the whole profusely adorned with ranges of sculptured figures, animals, and foliage. On each side of the light which occurs between the circular and the pointed arch is a small twisted column. The four towers of the transept are each different in detail, and have been executed at different times. They all display, however, a mixture of pointed and semicircular arches.

The whole length of the cathedral within the walls is, as nearly as I can estimate it, 420 feet. The transept, which is nearly in the centre of the building, is 212 feet from north to south. The width of the nave including the aisles, is 70 feet; the choir is a few feet wider. The height of the choir is 110 feet. As a datum for comparison, it may be mentioned, that Salisbury Cathedral, according to Mr. Britton, is 450 feet long within the walls, 78 feet wide in the nave, and that the height of the choir is 81 feet; in other words, it is 30 feet longer, 8 feet wider, and 29 feet lower than that of Tournay.

Concerning the age of the cathedral there has been some controversy. Mon. B. C. Dumortier, a member of the Belgic Chamber of Representatives and of the Royal Academy of Brussels (and in company with whom the writer had the good fortune to examine the building), published first in 1837,‡ some remarks on the cathedral, and then in 1841, a second pamphlet,§ with a view to prove that the nave of the existing building belonged to the sixth century. These essays display much learning and ingenuity, but more enthusiasm, and this latter has served to blind the writer to all that militated against his desire to obtain unlimited reverence for his favourite building, and, like an unruly Pegasus, has carried him far away from the goal he sought, namely the truth. Absence of direct statement by early writers that the nave was destroyed, serves to prove to M. Dumortier (as in some similar cases it has been urged by other continental antiquaries) that it has not been rebuilt, and so far from the fact that pointed arches form an essential feature in it being deemed sufficient to weaken his opinion, it is proof strong as holy writ that the system of pointed architecture arose in Belgium, and that in the cathedral of Tournay is to be found its first out-budding. In confirmation of his opinion, M. Dumortier informed me, that a charter had been recently discovered, dated 1257, proving that the architect of Cologne Cathedral was a Belgian. It sets forth that the monks of Cologne, in consideration of the services performed by Master Gerard, of St. Trond (*Gerardus de Sancto Trudone*), in directing the construction of their cathedral, had assigned to him a certain estate of land.

There is sufficient evidence to induce the belief that the cathedral was founded at the end of the third century, and rebuilt about the middle of the fifth century, with the aid of Clovis, by St. Eleutherius. Chilpéric in 578. endowed the cathedral largely, and his original deed of gift, "*cum sigillis*," remained among the archives of the chapter until they were burnt in 1566.* Louis le-débonnaire added to the cloisters of the cathedral in 817, and Charles the Simple further endowed it. Soon after this, however, namely in 882, the Normans ravaged Belgium with fire and sword, and inspired such universal dread, that the people, adding to their prayers "from the fury of the North men, Good Lord deliver us," fled in all directions. Tournay, rich and important as it then was, did not escape; the walls and the chief buildings were destroyed, and the inhabitants were forced to abandon the town, to which it seems they did not return until the beginning of the tenth century. At the time of this invasion there can be little doubt the cathedral was pillaged, and partly, if not wholly demolished; and it is probable that its re-erection was not attempted until quite the close of the tenth century, in which the inhabitants returned, or rather the beginning of the eleventh. All analogy shews that earlier than this, the nave and transepts could hardly have been commenced, and that it was probably much later before they were completed.† If analogy, however, were deemed insufficient to remove the ground for controversy respecting the age of the cathedral, it would seem to be destroyed by the recent discovery of a MS. entitled "*Ritus Officii divini ecclesiæ Tornac*," and dated 1656. This gives a list of the various fêtes formerly celebrated in the cathedral, and points out the 9th of May (which was then annually celebrated) as the anniversary of the dedication of the church, in the following words: "*Dedicatio ecclesiæ, est festivus dies in populo intrà muros. Triplex est cum octavâ et duplex primæ classis*;" and then, *Videliscet novæ, anno* 1066." Monsieur T. Le Maistre d'Anstaing, who mentions this MS. in his very interesting work on the cathedral,‡ remarks that doubtless there were more consecrations than one, as for example that of the choir, and those after partial restorations; but that this being the first, was properly regarded as the most important, and, being duly observed, had been handed down to the date of the MS. alluded to.

In a comparatively short space of time after this date, if the historian Jean Cousin is to be believed,§ the choir becoming too small and probably being injured by the events of troublous times, was cleared away to make room for a more magnificent structure. Cousin states, that the first stone of the new choir was laid in 1110; and that it was finished about 80 years afterwards or more. His authority for this statement, however, does not appear. According to certain old chroniclers quoted by M. d'Anstaing, it was vaulted in 1242, at the expense of Walter de Marvis; but it would seem that divine service had been performed in it previous to that date, its dedication being ascribed to the year 1200.

At the end of the twelfth century, pointed architecture was but just developing itself, so that we must conclude either that the choir of the cathedral of Tournay is one of the earliest monuments of that style, or that the received statements are erroneous. I am inclined to believe the former.

The restoration of this noble monument has been proceeding for several years past, at the expense of the nation, and is approaching to completion. There is a rough sketch of the building by the writer in the sixth volume of the *Civil Engineers' Journal*.

GEORGE GODWIN.

* There is a curious gallery of this description round the Eglise de Chateau in Tournay.

† The west front had originally two small towers at the angles. These towers at the extremity of the west front are found in many buildings in Belgium, at the Eglise de Chateau before mentioned, St. Bavon, Ghent, &c.

‡ "Revue de Bruxelles," Dec. 1837.

§ "Dissertation sur l'age de la Cathédrale de Tournai." Bruxelles, 1841.

* The deeds must have been very numerous, if we believe a contemporary writer, who says that the melted wax from the seals formed a stream down the hill.

† It is but fair towards M. Dumortier to give in his own words, his argument against the assumed destruction of the cathedral by the Normans:—"L'histoire de la translation du corps de Saint Eleuthère sous l'évêque Hédilion en 876. immédiatement avant l'invasion des Normans, nous fait connaître qu'à cette époque l'on avait démoli la chapelle de Saint Etienne, qui était située à la suite de la cathédrale. Voici comment s'exprime la chronique écrite au XIe siècle: *Prenulatum tornacensis ecclesiæ Heidelone, viro prudenti et justo possidente, basilicu beati Stephani, prothomartyris, quæ sita est post ecclesiam Christi genitricis semperque virginis Mariæ destructa est.* (a)

Le soin que prend le chroniqueur à nous apprendre la destruction de la chapelle de Saint Etienne annexée (?) a la cathedrale, indique clairment la conservation de celli-ci. Si ce vaste monument, dont l'existence est démontrée et au VIe et au IXe siècle, avait été détruit lors de l'invasion des Normands, le chroniqueur se serait-il borné à nous apprendre la destruction d'une de ses parties? C'est ici que s'applique se vieil adage; *inclusio unius, exclusio alterius*. Ainsi il demeure démontré que la cathédrale de Tournai ne fut pas detruite à cette époque, et qu'elle resista á l'invasion Normande. En effet, celui qui a vu ce noble édifice, et considéré l'épaisseur, des colonnes de sa partie romane, la solidité des matériaux employés a sa construction, n'hésitera pas à reconnaître qu'avec de tels matériaux il existait des conditions de durée que l'on ne retrouve pas dans les églises des provinces Rhénanes, et qu'ainsi s'explique pourquoi Nôtre Dame de Tournai a pu résister à une époque où tant d'autres édifices religieux ont succombé Au lieu d'être construite comme les églises des bords du Rhin en un calcaire sablonneux, friable et de peu de durée, la basilique de Tournai est construite en calcaire anthraxifère, espèce de marbre tres dur, et faisant feu sous le briquet. Pour détruite un édifice aussi gigantesque et composé, de pierres aussi solides et aussi massives, il faudrait de milliers d'ouvriers et un travail de plusieurs années. Or, les Normands avaient toute autre chose à faire que de passer leur temps à un tel ouvrage. Aussi, tous les chroniqueurs et les historiens de Tournai ont parlé de la Cathédrale, et l'on ne trouve, dans leurs écrits, aucune indication d'où l'on pourrait induire que ce vaste monument aurait été détruit et reconstruit à la suite de l'epoque carlovingienne. Au contraire, preuve certaine que l'édifice etait deja bien vieux à cette epoque il est constant que le chœur roman fut démoli vers la fin du XIe siècle, et qu'en l'an 1110, l'on commença la construction du chœur actuel, l'un des monuments les plus vastes et les plus hardis de l'art gothique."

‡ "Recherches sur l'Histoire et l'Architecture de l'Eglise Cathédrale de Notre Dame de Tournai." 1842.

§ "Histoire de Tournay par Jean Cousin," Douay, MDCXX.

(a) Elevatio corporis beati Eleutherii tornacensis episcopi et confessoris; MS. in Libro Sancti Martini Tornacensis.

FATAL ACCIDENT AT THE GREYFRIARS' CHURCH, EDINBURGH.

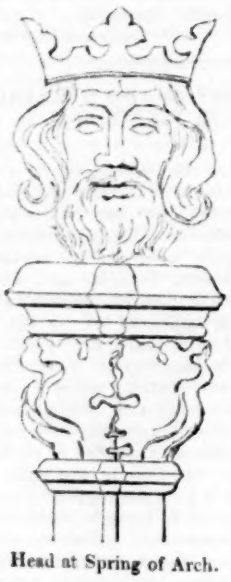
It will be in the remembrance of our readers, that in January last, the old and new Greyfriars' churches were partially destroyed by fire. The authorities having resolved to restore the former building, its repair was undertaken by Messrs. Turnbull and Thompson, as contractors, in accordance with a plan submitted to, and approved of by the town council, by Mr. James Smith, architect. The works had been in progress for several weeks prior to the 14th instant, when at a few minutes before 9 o'clock A.M., two pillars and three arches of the church, together with a large quantity of mason-work, fell down with a tremendous crash, burying in the ruins four workmen, one of whom we regret to say lost his life. It is worthy of remark, that notwithstanding the melancholy and sudden occurrence of this catastrophe, it was not altogether unforeseen, for it appears that one of the workmen had noticed the impending position of the walls, and intimated to his employers that he would, in consequence, work no longer, and that the man took away his implements a few minutes before the event happened.

To convey a correct idea of the cause of the accident and the precarious position in which the workmen were placed, we may state, that the inside of the building is divided into three compartments, by two rows of pillars of the pointed style, the space between the two rows forming the main area of the church, while in the spaces between the pillars and the outer walls stood the galleries, north and south respectively, before the late fire. Not only had the wooden work been completely consumed by the conflagration, but the masonry was also much calcined and corroded by the flames, while the pillars in particular were so destroyed by the same devastating element, that they were completely pulverised, the stone and lime being dried up and quite friable. It was on one of the pillars of the northern row that the men were employed. The masons who were occupied in tombing or squaring down the wreck of the former pillar so as to give it a fair exterior by the aid of outward liming and other patch-work, were thus gradually depriving it of the little strength it retained, till the power of support having been destroyed, the frail fabric instantaneously gave way, carrying with it the adjoining pillar, the mason work of three arches, and a great mass of superincumbent material, and involving the unfortunate men in the ruins.

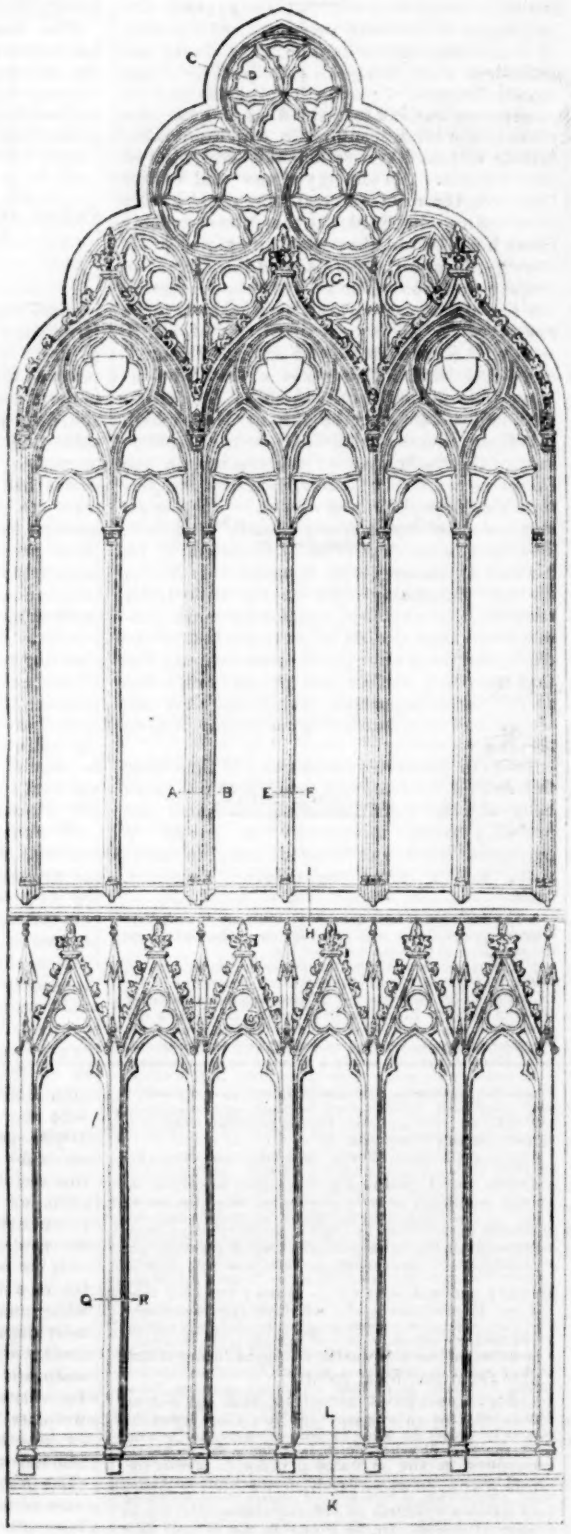
The *Edinburgh Advertiser* says, that much blame is attributable to the town council in this affair; and the public voice very generally condemns their injudicious and, as it has now turned out, fatal parsimony in adopting a plan on so limited a scale as not to admit of the secure and efficient restoration of the churches.

TESTIMONIAL TO MR. BRITTON. — The dinner is fixed to take place, at the "Castle," Richmond, on Monday, July 7th, the Right Hon. Thomas Wyse, M.P., in the chair, and we shall hope to see a numerous gathering of those who are interested in the architectural antiquities of the country.

NEW DOORS AND DETAILS FROM YORK MINSTER.

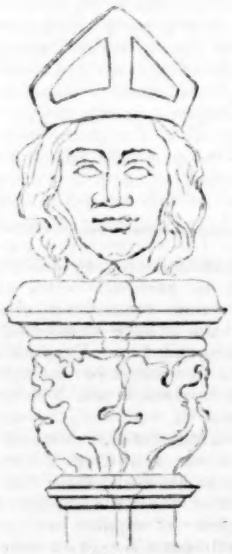


Head at Spring of Arch.

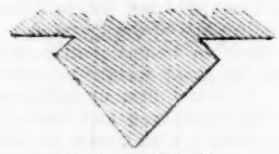


Section on C—D.

Section on G.



Ditto.

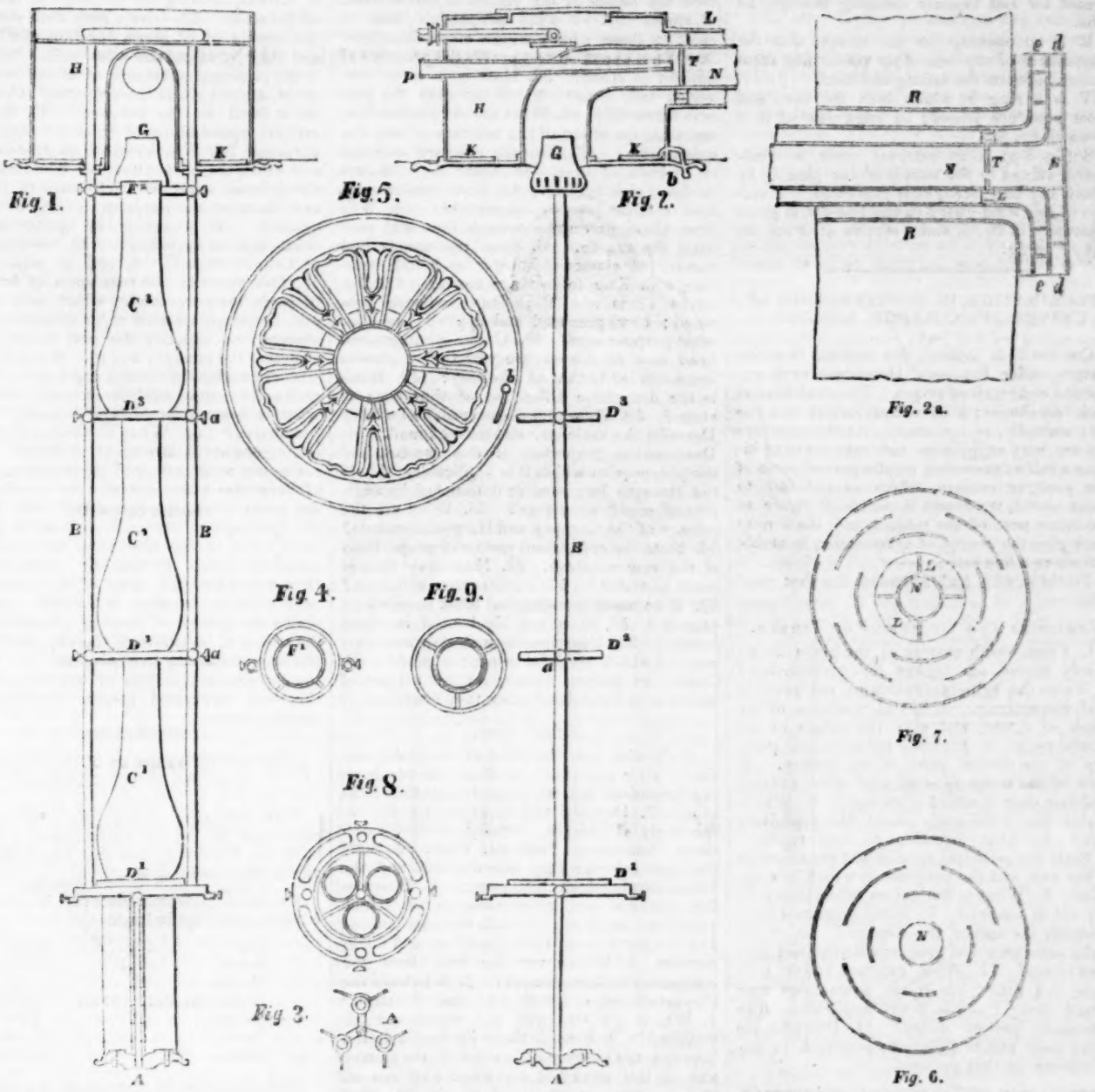


Section on M—N.

Section on O—P.

NEWSPAPER
BUILDER

PENDANT GAS LAMP.



NEW DOORS AND DETAILS FROM YORK MINISTER.*

Our engraving represents the new centre door in the west front of the minster, as recently executed from the design of Mr. S. Smirke. The details given last week with our view of the north (and south) door, as well as those now added, belong equally to all the doors and are drawn half the real size.

The dotted lines on section A—B (last week), shew the hood moulding and capitals.

PENDANT GAS LAMP.

We have received the following account from Mr. Jones, the inventor, and insert it as bearing on the subject of ventilation :—

This mode of burning gas, to which the inventor directs attention, is the subject of a registration, and presents a system of discharging the deleterious gases in many respects superior to ventilated gas lights, which have preceded it. It is peculiarly adapted for consuming gas highly carbonized by Mr. Lowe's patent process of naphthalizing, owing to its being raised to a high temperature previously to combustion at the burner. It is intended to use, in conjunction with this light, the earthenware pipe and conical glasses patented by Mr. Grant, for the purpose of causing a more rapid discharge of the vitiated air, and also to diminish the quantity of radiated heat attendant upon the use of metallic pipes. It will be observed from the accompanying diagrams, that not only are the products of combustion completely discharged, but the apartment in which the light is fixed is thoroughly ventilated and kept at any degree of temperature at pleasure. Back draught is avoided by the construction of the external wind-guards, thus ensuring an atmosphere at once healthy and under perfect control. It may be as well to state that this mode of lighting is equally applicable to a public building, or a private apartment, any quantity of light being obtainable from one focal point.

Fig. 1 is a front elevation, and fig. 2 a side elevation of this lamp and its appendages. A is a compound burner consisting of three burners on the Argand principle, arranged in one plane, so as to produce one strong column of light, as shewn in the separate plan of this part of the apparatus given in fig. 3. B B are two tubes, which conduct the gas from the supply-pipe downwards to the jets of the burner.

C^1 C^2 C^3 are three bulb-shaped glass chimneys, rising one above the other, and resting, just below their greatest diameters, on rings D^1 D^2 D^3, which is connected to the supply-pipe, E E, which are pendent from the roof, and common to all three. A plan of the lowest ring, D^1, is given in fig. 8. The top of each of the two lower chimneys, C^1 C^2, rises a little way within the chimney immediately above it; the height to which each is so raised being adjustable at pleasure by means of the thumb-screws *a a*. Within each of the rings, D^2 and D^3, there is an inner ring, F^1 (fig. 4), which encircles and serves to keep steady the tops of the chimneys C^1 and C^2. The top of the chimney C^3 is also encircled and steadied by a similar ring, F^2, which is attached by radial arms to the funnel G.

H is a ventilating head, or cap, which is inserted between the ceiling of the room in which the lamp is hung and the floor of the apartment above. It has openings on the under side which correspond with similar openings in the fly-plate K. The ornamental face-plate is represented in fig. 5. K is the fly-plate, by turning which round, by means of the knob *b*, the different apertures are opened or closed, and either wholly or partially, at pleasure. L is a pipe, which is carried from the head H in a lateral direction, through the wall M, to the external atmosphere.

The metal funnel G opens into a pipe N, which, passing up the centre of the head H, turns off at a right angle, and terminates in the wind-guard (fig. 2*a*) on the outside of the building.

While the more immediate products of combustion pass away through the chimneys C, Funnel G, and pipe N, the heated and vitiated air of the apartment escapes through the openings in the ventilating head H, along the pipe L, to the wind-guard S.

P is a small conical draught-pipe, which is

* See p. 294. *ante.*

carried from the outside of the building, through the ventilating head H, into the funnel-pipe N, terminating just beyond the right angular bend of the latter. The cold air rushing through this pipe serves to impart a great increase of velocity to the column of heated air and vapours escaping through the tube.

R is an opening for the escape into the atmosphere of any heated air which may accumulate between the ceiling and floor.

T is a ring by which both the outer and inner pipes are joined; an edge view of it is given in fig. 9.

S (fig. 2 *a*) is an external cover or wind-guard, affixed to the mouth of the pipe L, by which any back draught is prevented. A section of this wind-guard on the line *d d*, is given separately in fig. 5, and a section of it on the line *e e*, in fig. 7.

EXAMINATION IN CONSTRUCTION AT UNIVERSITY COLLEGE, LONDON.

On the 24th instant, the students in architecture under Professor Donaldson were examined and received prizes. The examination took two shapes; first, in architecture as a fine art; secondly, as a science. As the questions put are very suggestive, and may serve to induce a self-examination on the part of some of our younger readers, which cannot fail to prove useful, we insert those which relate to the latter part of the subject, and shall next week give the course of examination in architecture as a fine art.

To those who had attended the first year only:—

Varieties and Qualities of Timber.

1. From which quarter of the globe do we chiefly derive our timber for construction? 2. Name the principal countries and ports in each respectively. 3. Sketch a section of the trunk of a tree, and affix the names to the several parts. 4. State the purposes and qualities of the several parts of the section. 5. How is the wood formed, and what general evidence does it afford of its age? 6. Which timber tree principally shews the medullary rays? In what direction do they radiate? 7. State the principal species and peculiarities of the oak, and the purposes to which it is applied. 8. What is the nature of the decay by dry rot in timber? 9. What portion is most probably the seat of the disease? 10. What is the substance that produces the rot, and how does it act? 11. What external causes promote dry rot? 12. What precautions may retard decay? 13. What application may effectually prevent decay? 14. Describe the three most recent processes proposed as applications for that purpose.

Application of Timber to Construction.

15. To the action of what forces is timber subject in construction? 16. Is the resistance of timber to these definite or indefinite? 17. Which are the proper measures of resistance for practical purposes? 18. Which are the principal modes of placing a piece of timber to carry or support a weight? 19. What proportion does a weight, placed in the centre of a piece of timber supported at both ends, bear to the same weight if distributed over the whole length? 20. To what force are the upper fibres of a loaded beam subject, and to what the lower? 21. What is the object in designing the frame of a roof? 22. What is the effect of superabundant material? 23. Sketch a king and a queen truss complete with the gutters and slating, and put the names to all the parts, and mark the straps and bolts. 24. What are the respective uses of the different parts? Draw the articulations of the junctions of the timbers. 25. What is a principal? 26. How far should principals be apart? 27. Sketch a Gothic collar roof, and put the names to the several timbers. 28. How many classes of floors are there? Sketch and describe them respectively. 29. How do you find the greatest point of pressure upon the centring for an arch or vaulting? 30. How do you determine the position of the straining-piece? 31. At what angle do voussoirs of an arch begin to slide or slip? 32. Sketch the centrings for a semicircular arch, scheme and elliptic arches. 33. Describe the scaffolding used for placing the statue of Napoleon on the Colonne Vendôme at Paris. 34. As also that for erecting the Luxor Obelisque in the same city.

Limes, Mortars, Cements.

35. What is the basis of all mortars? 36. In what division of stones does it prevail? Give the names of the classes of that division of stone. 37. In what proportion does it exist in those stones where most abundant? 38. What chemical test proves the presence of lime in a stone? 39. How is a stone converted into lime? 40. What does the process throw off? 41. What are the phenomena, and what the effect of the addition of water to quick lime? 42. Give the chemical analysis of hydrate of lime. 43. State the different modes of slaking lime. 44. How much weight does a stone lose by calcination? 45. Will lime alone produce a mortar that will set? State the reason. 46. State the names and number of classes of substances which combine with lime to produce mortar. 47. Describe Traas and Pozzolana; whence procured; how prepared and applied; and for what purpose used. 48. Under what general head may be classed the varieties of cement stone similar to that of Sheppey? 49. What is the distinctive difference of that class of stone? 50. By whom discovered, and when? Describe the varieties, and where found. 51. Describe the properties of this cement, and the purposes to which it is applicable. 52. Is the strength increased or diminished by addition of sand? wherefore? 53. What are the colours of the Sheppey and Harwich cements? 54. State the component parts and proportions of the cement stone. 55. How may the cement be tested? 56. In what time will it set? 57. Who made experimental brick beams with cement? 58. Was any bond used in these beams? 59. Describe the materials and process by which artificial cement is made. 60. Name the leading writers on the subject of mortars, and the dates when they flourished.

Second Year.

1. Of what does the crust of the globe consist? Give a section. 2. State the two leading formations into which geologists divide the crust. 3. Describe the constituent parts respectively of granite, statuary marble, sandstone, limestone, Portland, Bath. 4. State the parts whence they are derived, and the formations to which they belong. 5. Describe the chemical and mechanical causes which contribute to decay in each of these stones, and the parts most liable to decay and disintegrate. 6. Which are the best tests for limestones and sandstones? 7. What are the characteristics of good and bad Portland? 8. Which are stratified, and which are unstratified? 9. Should there be any relation between the position of a stone in the quarry and in the work? if so, why? and are all stones subject to the same law? 10. Will every stone once placed in construction be strong enough for all practical purposes, if so, what proof is there of that fact? 11. Which stones are generally the strongest and hardest?

Masonry.

12. If isolated supports have a great weight to bear, what must be the nature of the material? 13. Which are the most ancient edifices? those which are lightest, or those of heaviest construction? 14. What proportion does the crushing weight generally bear to the splitting weight? 15. Describe the various modes of construction used by the Greeks and Romans, as enumerated by Vitruvius. 16. What are the general precautions to be used in solid construction? 17. What is ashlar and what the precautions to be taken when it is used? 18. Describe the causes of settlement in the French Pantheon, Paris. 19. Should any precautions be taken as to quoin stones? 20. What is the greatest inclination at which a mass may be without falling? 21. In what direction do all bodies tend to fall? 22. How are bodies best upheld? 23. On what practical circumstances does the solidity of masonry mainly depend? 24. State the best proportions for cubical blocks of stone. 25. Give the particulars of some large stones used in ancient construction. 26. Sketch the forms and describe the use of cramps, plugs, and dowels. 27. Which are the best metals for such purposes? State the reasons. 28. Sketch and describe the instrument inserted into a block of stone for the purpose of raising it. 29. Describe the precautions used as to vertical joints and joggled joints. 30. Into how many classes may be divided the stability of edifices? 31. Is the greatest thrust in those covered by a vault, or by a trussed timber roof, and why? 32. Give a section of the treasury of Atreus, shewing the direction of the joints of the stone. 33. Give a plan and section of the cupola of S^{a} Maria dei Fiori at Florence, and state by whom and when built. 34. What is the principal substance of which bricks are made, and what are the properties which render it fitted for the purpose? 35. State the earliest applications of brick for constructive purposes. 36. Which nations used the sun-dried and which the burned bricks? 37. Enumerate the different sorts of bricks used in London, and describe the purposes to which they are applied. 38. Describe the various sorts of bonds used in brickwork. 39. Give examples of hollow walls 9, 14, and 18 inches thick. 40. Describe the different sorts of lead used on roofs, the purposes for which each is fitted, and the proper weights under different circumstances. 41. Specify the best mode of constructing the gutters; and give sections thereof with dimensions of the fall and drips. 42. Describe the various qualities of iron. 43. From what is iron extracted, and generally in what proportion? 44. What is Tredgold's remark as to permanent alteration of form? 45. Is resistance to flexure or to permanent alteration of form the safer criterion in construction, and under what circumstances? 46. What is the best section for an iron beam or girder? 47. Which is the best form for economy of material, which the best for stiffness? 48. Give the names and sizes of the slates generally used for roofing in London. 49. Describe the process of zincing galvanized iron, the object to be obtained thereby, and the application to constructive purposes. 50. Specify the component elements of bronze, and name the most celebrated bronze monuments of modern times.

COST OF SEWERS IN THE HOLBORN AND FINSBURY DISTRICT.

The following tenders for sewers lately contracted for by the Commissioners of Holborn and Finsbury, and the Tower Hamlets, afford some useful data.

For sewer in Warner-place: 4 feet by 2 feet 6 inches; 2967 feet in length:—

Hill	£2,345
Ward	2,340
Munday	2,244
Blackburn	2,220
Stewart	2,210
Crook	2,197
Curtis	2,194

Wellington-street to Silver-street: 4 feet by 2 feet 6 inches; length 1915 feet.

Ward	£1,480
Curtis	1,447
Stewart	1,420
Munday	1,410
Blackburn	1,400
Crook	1,391
Hill	1,390

Wentworth-street: 4 feet by 2 feet 6 inches; length, 660 feet:—

Blackburn	£675
Hill	615
Curtis	584
Stewart	570
Crook	539
Livermore	538

Rhodeswell: 4 feet 6 inches, by 3 feet; length, 200 feet:—

Livermore	£167 0
Dicks	162 10
Crook	152 0

King's-road, St. Pancras: length, 250 feet.

Eldred	£249
Ward and Son	241
Cooper	205

The New Houses of Parliament.—Messrs. Foley, Marshall, and Bell have been selected by the Commissioners of the Fine Arts to execute the statues of Hampden, Falkland, and Clarendon, for the New Houses of Parliament.

ARCHITECTURAL PROGRESS AT HOME AND ABROAD.

The annual report of the council, about to be distributed to the members of the Royal Institute of Architects, contains the following interesting *resumé* of architectural proceedings during the past year:—

"On the Continent, our honorary and corresponding members have afforded striking evidences of their abilities by the completion of some fine works. The church of S. Vincent de Paul, at Paris, by M. Hittorff, has just been opened for divine worship.* He has, with much ingenuity, adopted various means of producing effects, by the introduction of coloured decorations in enamelled plates, and this example is rendered the more valuable by the publication by that gentleman, in a pamphlet, of the principles which have guided him in this conception. Our friend, Herr Zanth, of Stutgard (the colleague of M. Hittorff in the valuable work on the Monuments of Sicily), has just completed an edifice in the Moresque style for the King of Würtemburg, which has been noticed in the foreign journals as highly successful.

The French have also completed some remarkable works of architecture, which the energy, taste, and liberality of their ancestors had begun. The Hotel de Ville, at Paris, a work of the 16th century, has for many years been in a course of enlargement and completion. The exterior is now entire, and the interior is in progress with all the richness of embellishment of which the "*Re-naissance*" affords such splendid examples, and to the production of which the genius of its architect, M. Serrure, is fully equal. This edifice is now the worthy municipal palace of the French capital, little, if at all, inferior in grandeur of arrangement and decoration to that of the sovereign. The Prefect of the Department of the Seine, in carrying out this fine conception, has felt and acted as the chief of not merely a locality, but of a powerful, an enlightened, and an art-loving community. Our own metropolis has, also, within the last twelve months, been improved by various public works, of which some are completed, and some still in progress. The new Royal Exchange, with its accessories, forms an imposing feature of the city; the completion of Trafalgar-square, with its terraces, flight of steps, fountains, basins, and triumphal column, shews that a feeling has arisen in the public mind for rich and effective combinations of objects of a monumental character. The thoroughfare near Leicester-square, those from Oxford-street to Holborn, and from Long-acre, northward, and that near Whitechapel, with the lines of lofty houses in progress, already add considerably to the appearance of the Metropolis, and cannot but contribute essentially to its greater comfort and healthiness. The street architecture of Paris is on a scale of more grandeur than ours, and the facility of employing a cheap stone affords the French architect greater scope for his fancy and the opportunity of giving the houses a more imposing character than brick is capable of producing. It cannot, however, be denied that, notwithstanding the disadvantages imposed upon it, not only by the inferiority of our materials, but likewise by our domestic habits, the street architecture of London has of late years assumed a new and more important character.

Within a few days the Conservative Club-House, the production of two of our fellows, has been opened. It is another evidence of the increasing importance of architecture, and gains additional interest as a work of art, by the bold application of polychromatic embellishment judiciously and fearlessly introduced throughout its principal apartments, important as tending to improve the taste of many, who may, in their own residences, carry out the art of embellishment to its full devolopment.

The progress made in the arrangements for improving, at least partially, the banks of the river Thames, may lead us to hope that the construction of a line of public quays in the heart of the metropolis, will, at no distant period, secure to us the advantages in the ornamental, which this ample stream already possesses in a commercial point of view, to a greater degree than that of any other capital in the world.

The important Act for regulating the buildings of the metropolis and its environs, passed during the last session of Parliament, came into operation at the beginning of the present year. The object of its framers has evidently been to guard against unsound construction, to prevent as much as possible danger from fire, and to insure a greater degree of healthiness in a class of dwellings hitherto too much neglected. It is to be hoped that similar benefits, modified to suit local exigencies, may be extended to other parts of the country, where too often the humbler classes become the victims of ill-drained and ill-ventilated habitations.

A great movement has lately been made, in regard to providing for the health and amusement of the humbler classes, whose physical and intellectual condition is now occupying a large share of sympathy and attention. In many of the principal manufacturing and commercial towns and cities, liberal subscriptions have been raised for the purchase of plots of ground, and for the formation of public gardens. A society has likewise been formed in London for the erection of public baths and lavatories. We can hardly expect to vie with the ancient Romans in the construction of their thermæ; but it is to be hoped that in the erection of the baths of the British metropolis, their frequenters will not be regarded as insensible to the beauties of architecture, and that the art will be employed in aid of utility. Why should not the million have the privilege, in their places of public resort, of refining their taste, and exciting their imagination? why should they be bound down to cold sentiments of mere utility? May they not also unite the agreeable with the useful, and feel that they have minds to be improved, tastes to be cultivated, and sensations to be excited by the contemplation of beauty and harmony, as carried out in the productions of the artist. Let us hope, then, that our public baths may be monuments of art, and an evidence of the taste and intelligence of the present day.

The propositions which have been urged for some time, on the propriety of establishing local museums of art throughout the empire, was made the subject of a paper read at a recent ordinary meeting of the Institute, by Mr. Wilson, director of the Government School of Design. Nothing could contribute more essentially than local museums to local improvement, as exciting attention, habituating the eye to fine form and correct detail, and promoting a comparison between objects good and bad. Thus, the mind, brought to think and to discuss comparative merits, and to investigate the sources of true intellectual enjoyment, must rise to a higher and healthier tone, and be satisfied only with the purer objects of refined taste.

In connection with this subject, it may be observed, that we possess, scattered throughout the country, numerous monuments and monumental effigies of the dynasties which have reigned in England, of the importance and beauty of which we may form some estimate from those in Westminster Abbey. It is to be regretted that they are allowed to fall into ruin, without any attempt on the part of our rulers to establish some general system for their preservation and maintenance. Never at any period have these styles of art been better understood, nor have our artisans ever been so able to restore these monuments faithfully to their ancient splendour.

It is to be remarked, that the Minister of the Interior, in France, has just applied to the Chambers for a grant of about 85,000*l.*, to be applied in the restoration of several historical monuments of that country.

* See BUILDER, p. 3.

HISTORICAL PAINTING — PREMIUM ONE THOUSAND POUNDS.—A notice with this heading has been put forth during the present week, and to it are affixed the names of Thomas Bell, Don Alkali Works, South Shields, and Charles Hill Roe, Hermitage, Aston-road, Birmingham. The competition is for an oil painting of the Baptism of Christ, to be not less than 12 feet by 10, nor larger than 15 feet by 12, and two years are allowed for the sending in of the paintings. We know nothing respecting the parties whose names are affixed to the notice, nor of the ultimate purpose for which it is issued, it will therefore be at least discreet on the part of artists to obtain further and more satisfactory information before they risk their time and substance.

NEW BUILDINGS AND IMPROVEMENTS IN EDINBURGH.

Since the building of the new town of Edinburgh, there has never been a time so rife in new buildings as within the last few years. The *Edinburgh Evening Post* gives the following particulars:—

The city, highly picturesque and beautiful before, has received several fine improvements in its appearance. Sir Walter Scott's monument, newly finished, is a grand object, and its great elevation overcomes the disadvantage arising from the somewhat low site on which it is erected. The spire of the Assembly Hall, a charming piece of architecture, is now one of the principal landmarks of the city. The only pity is, that the building is in a neighbourhood which does not at all harmonize with it in any thing, if we except some new edifices in the Elizabethan style, on which the old gloomy houses of other centuries seem to frown displeasure. It is nearly opposite, and down a close too—and that close the abode of poverty—that Mary of Lorraine, the mother of our beautiful but unhappy Mary had her palace and oratory. On the Calton Hill there is being erected a debtors' prison: the building is to the east of the gaol and bridewell, and will be included within the sweep of the same wall. Talking of this wall, we ought to observe that it is built exactly in the style of the battlements of an ancient fortress, and with its abutting watch-towers, harmonises well with the rocky elevation from which, on the south side, it rises. On witnessing the good taste indicated here, one cannot help contrasting it with the gross blockheadism which was unaccountably allowed to perpetrate the new barracks erected in Edinburgh Castle. They remind us of a manufactory or union workhouse, and one could almost wish they would tumble down when the inmates were engaged elsewhere. Additions are being made at the end to the north of the advocates' library. It strikes us that this building has been too much doctored—that it is spoiled and deteriorated by the patchwork addenda which are inflicted upon it. A new edifice would have been the preferable, perhaps the cheapest expedient of the learned faculty. The new Physicians' Hall, a fine building on the north of the New Town, is nearly finished. The front will be highly ornamented, and will form a choice acquisition to Queen-street, rather wanting in striking buildings. The Commercial Bank, erected on the site of the former Physicians' Hall, in George-street, is advancing. It will add another attraction to a street already one of the finest in Europe. It appears to be designed in the Italian palace style. Near it some striking improvements have been made in the buildings intended for public companies and banks. Nothing can be finer than the light, graceful, and ornamental fronts which we meet in this locality.

Donaldson's Hospital, to the west of the city, is progressing rapidly. It is a truly grand and noble structure, and nothing could have been more judiciously chosen than the fine elevation which forms its site. We understand that no less a sum than 100,000*l.* is to be expended in getting up the building, and adapting its internal economy to the purpose for which it is extended. A new Heriot's school, situated at the west end of Rose-street, is nearly finished. The "Political Martyrs'" monument in the Calton burying-ground is so far advanced, that it can be seen from the North Bridge. Additional erections—stations of railways, and other buildings are soon to be set agoing. And we believe that in addition to the commodious and elegant villas, and other buildings existing at Newington, a large number of houses are to be erected by one of our banks, which has recently obtained the greater part of the ground. A better site for building cannot be imagined, with its delightful southern exposure and salubrious air. It is a peculiar feature of the present era of improvement, that houses in streets occupied by the highest order of gentry who keep mansions in Edinburgh have been converted into shops and business establishments. This is particularly observable in George-street. The stream of rank has a tendency to flow northward in the direction of the back part of the New Town. The shops in several parts of Edinburgh have, in many cases been improved to a high degree of elegance, and, in some cases, decorated with very fine ornaments. One great evil has been removed from the

city, in the covering up of that huge, unsightly stream of dirty water which passed to the sea through the Queen's Park. A sad infliction it was. The laying out of the splendid carriage road, and the excellent arrangement of the grounds, will form permanent attractions to this delightful promenade. A wall around a part of the royal domains is still wanting, and should be set about: miserable hedges of whinstone are out of keeping in such a place. It is the felicity of Edinburgh, that close at hand to its busy streets and closely-wedged buildings are solitudes such as Zimmerman might have envied. From the park under notice a very short walk conducts to scenes as still and picturesque as are to be found in the secluded spots of the Grampians, while, at some point suddenly attained, there bursts forth the full majestic spectacle of a great and sublime city, and the hum of voices falls upon the ear like soft and distant music.

THE IRON TRADE.

The evils resulting from the late inconsiderate rise in the price of iron are daily developing themselves; they are great and numerous. The unsettled state of the trade in South Staffordshire is attended with the most inconvenient, if not ruinous, consequences. The manufacturers, especially the makers of heavy goods, are suffering under the depression caused by the recent extraordinary advance on the raw material, although there is an abundance of orders from Canada, and the United States, in Wolverhampton, Birmingham, and Walsall, the completion of which cannot be longer delayed.

The home market suffers in the same degree from the same cause. Travellers for factors now on their journeys in all parts of the kingdom are in many instances unable to take, and their employers at home unable to execute, orders for manufactured iron goods, on account of the uncertainty, in the price of iron. But bad as this state of things is, the mischief does not end here. At the time of the advance, the iron-masters considerately raised the wages of the workmen, and now, as a matter of course, some of them are proceeding with the reduced price of the article to attempt a corresponding reduction of the price of labour. A partial turn-out in the districts of Bilston and Wednesbury has been the consequence, and one riot of rather a serious character has already occurred.

From Newport we learn that sales of bar-iron have been effected as low as 7*l.* 5*s.* per ton.

ELECTRIC TELEGRAPHS.

The recent thunder storms, both at home and on the continent, have elicited some interesting phenomena connected with electric telegraphs. One of the needles on the dial at the Southampton terminus became unfitted for use by its polarity being destroyed, and the attendant who was working the machine at the time received a smart shock from the handle. At Rouen, the atmospheric electricity, combining at times with the current conveyed along the wires, impeded or precipitated the movements of the needle, giving to the composition the effect of dropped letters and occasionally destroying the sense of the intended phrase. M. Masteucci of Pisa, who is well known for his experiments in galvanism and electricity, has announced his belief that the electric telegraph can be made use of between Dover and Calais, the wires being sunk deep into the sea. He has arrived at this conclusion, from having succeeded in passing the fluid along wires immersed in the waters of the Arno.

A similar idea, only on a grander scale, of course, has been started in America. The *New York Tribune* proposes to run a copper wire, well covered and as large as a pipe stem, from Nova Scotia to the coast of Ireland. The writer says, "Its gravity would sink it to the depth where water was so dense as to be of equal gravity, and consequently beyond the reach of any kind of collision." While on this subject we may mention an experiment that was tried last week at Brussels, in the presence of the Minister of Public Works, by which the dispatch was written with a pen by the mere action of the fluid; it is stated to have been entirely successful.

DEATH FROM THE USE OF LEADEN PIPES.

An inquest has been lately held at Malvern Wells, on the body of an agricultural labourer named Richard Wilkins, who came by his death it appears from having drunk a quantity of cider which had been conveyed in leaden pipes from the cider-house to the place where it was drawn for use. It appeared that the deceased, with several others of Mr. Benbow's farm servants, had, after partaking of this cider, been seized with illness resembling the painters' colic, which it is known arises from the constant use of lead in their business. Mr. West, surgeon, of Malvern, at first attended him, but Mr. Hamilton, of Malvern-wells, attended the deceased at the time of his death, which happened on Saturday last. Mr. West explained that the deceased died of apoplexy, brought on, he believed, by drinking the impregnated cider. Mr. Benbow, the deceased's employer, explained to the coroner the circumstances under which the pipes had been laid down. He had employed Mr. M'Cann to lay down pipes of the proper white metal, tin, or composition; but he (Mr. M'Cann) had substituted lead, saying it was superior for the purpose. On the discovery of the mischievous effects produced, the use of the pipes had been discontinued. The jury acquitted all parties of blame except Mr. M'Cann, and returned a verdict "that the deceased died of apoplexy, induced by congestion of the brain." The coroner intimated that, after an investigation like this, every farmer and publican using such pipes would be subject to a verdict of manslaughter or murder in the event of a similar catastrophe.

The fact is well known that leaden pipes and cisterns become dangerous when the water which fills them is soft and pure. The lead, however, which the water takes up may be removed by filtering the water through paper, a circumstance which has been explained by supposing that the oxide of lead is not really dissolved in the water, but merely suspended in it. At a recent meeting of the chemical society, Lieut.-Col. Philip Yorke stated that the oxide of lead is taken up by the substance of the paper and combines with it, from an affinity such as subsists between the same metallic oxide and cotton fibre; the last taking the oxide from solution in lime-water, and lead being often fixed as a mordant on cloth for dyeing in this way, according to the statement of Mr. Crum. He stated also, that the power of the filter may be exhausted, and that therefore it would be unsafe to trust to the action of a filter to separate oxide of lead from water for an unlimited time.

THE BURIAL GROUND NUISANCE.

The manner in which the action brought against the parties concerned in the Spafields burial ground has terminated has astonished all persons who are interested in the matter. Immense trouble had been taken by individuals, and much expense incurred, especially by Mr. G. A. Walker, and by Mr. Watt who lives near the ground; the former was in court prepared with evidence which would have frightened the country into some change in the system, but the whole was frustrated by the course pursued by the counsel for the crown, a course which we find it very difficult to account for. It is to be hoped that Mr. Walker, to whom the chief merit of laying bare the enormities of the system belongs, will not be discouraged in his praiseworthy efforts to abate one of the most serious evils existing in the metropolis.

SONNET ON LINCOLN MINSTER.

I've seen the *Lyncolne Mynster* and the hill
Which for long centuries it hath yerowned,
And in beholding, such delight have found
As our forefathers' pious minds did fill
At the evolving from th' inspired will,
A work yet onward endlessly renowned.
Æthereal Fancy! thou art here unbound
Roving from human deeds of subtle skill,
(Pillar and lancet-arch, and tracery rare,
Proportion, whose perfection bears a spell!
The Votive Chapel, proofs of holy care,
With roof by worthy Willson carved well)
Unto the destination of my prayer,
Where our great God, beneficent, doth dwell.

J. Ellis.

THE ROUND TOWERS OF IRELAND.

Sir,—Now that the subject of the origin and uses of the ancient round towers of Ireland is again before the public, I shall deem it a favour (as an old correspondent) to be allowed to offer a few observations upon it through the columns of The Builder.

I may premise that some of our most learned antiquaries have promulgated opinions in regard to those towers quite inconsistent with an actual *inspection* of these interesting memorials, *connected as they are* with the adjoining ecclesiastical ruins,—for the ruined church and the old tower are invariably found near each other. Now the periods assigned to the erection of the old churches seem scarce a matter of dispute; in fact, their dates of construction are given with as much precision as of yesterday, whilst no notice appears to be taken of their "next door neighbour," the old tower.

On this omission on the part of early writers I shall hazard an opinion: it is simply this, that the date of the tower and that of the adjoining little church are one and the same, for reasons which I shall give before concluding. Should this assumption appear probable, for direct proof is out of the question, it follows that much of the obscurity connected with the earlier notice of our old ecclesiastical edifices may be cleared away, by considering the tower as a *part* or in direct connection with the church. Viewing the brief and simple notice of the old chroniclers, we find it seldom went beyond naming the founder of the church, the period of erection, and the name of the locality where erected, and passed over all architectural details as apparently unimportant. To the scanty materials thus supplied by early historians in respect to the towers, modern commentators have not hesitated to supply details; as many of the fanciful theories advanced by our antiquaries rest on the analogy between certain *Phœnician* and Egyptian antiquities and the round-towers; while others still more numerous draw all their resources from some antiquated glossary of the Irish language having reference to the derivation of *names* said to belong to the old towers.

Many of these learned inquiries were carried on *in the study or library* of the antiquary, and the result when before the public was attacked and instantly demolished by some contemporary, by precisely the same mode of reasoning as that adopted by his opponent, neither parties bestowing a *single* thought on the *stone and mortar* of the round-towers, beyond the undeniable fact of their being well built, a truth known to everybody. The old tower of Aghadoe, near Killarney, though apparently wanting in character from being what is denominated a "*Stump*," *or ruined tower*, is nevertheless not without interest, arising from a comparison of the quality of stone with which the outer casing of the tower is constructed (pale yellow sandstone), and the stone employed in the door and window-jambs of the ruined cathedral or church close by, the stones referred to in both buildings being precisely of a similar class of rock: and here I may observe that no yellow sandstone rock is nearer Aghadoe than 30 miles. Having had ample opportunities of comparing the stones in both ruins during a stay of seven months at Killarney, I found the angles or ornamented parts in the church shewed more signs of decay than the stones of the round-tower; but this is easily accounted for from the circular form of the tower; the ashlars having no exposed ends or joints, are less liable to be acted on by changes of the atmosphere than the stone used in the church.

To understand the matter fully, it is necessary to offer a suggestion not heretofore made. Whoever proposed to build a castle, abbey, church, &c., without first consulting their architect? That our ancestors had wisdom and sagacity enough to follow a similar course there cannot be a reasonable doubt. The object of such consultation would naturally be to look to the locality, the site, water, and, in the *then* early days, the procuring of *efficient workmen* and materials. These preliminary steps settled, the architect, who in all probability was an ecclesiastic, would, as a matter of necessity, say how am I to protect my work-people, collected here with great difficulty, from the assaults of the marauding Dane, and the not less dangerous attacks of the turbulent natives? The project of the

round-tower was a noble idea, it affording lodging for the architect and masons; here he could at a glance have a bird's-eye view of his little church as it progressed towards completion; here he kept his people under his eye in *a circle*, propounded his plans, and, "though last not least," was safe from any *nightly* attack, from the elevated position of the doorway. No doubt it afterwards formed a useful appendage to the church as a depositary for books and other valuables of the church, as well as affording a certain landmark (by its lofty proportions) in a country nearly covered with wood to the weary pilgrim and traveller. It is easy to make objections, as by asking "Where did the architect and workmen reside, or how guard themselves from attacks from hostile parties, while the tower was in progress of building?" To such objections I will merely say, the zeal shewn by the people in every great undertaking, and that for a religious purpose being best calculated to excite the feelings, might have the effect of collecting a body of persons not only able to assist in the work, but by their numbers to overawe any hostile parties daring to approach. That such laudable zeal *at last* may have gradually died away it is but reasonable to conclude, but then one great object was attained, the building of the tower.

Hence I conclude, the tower and the adjoining church are of one and the same age and period.

Gorey, June 7th, 1845. J. K.

Correspondence.

FIRE-PROOF STAIRCASES.

Sir,—The late fatal fires in Dover and Fenchurch-streets fully prove the absolute necessity of *especially* constructing staircases fireproof, by which the inmates could make a safe retreat from a dreadful death. Although I am neither an architect nor builder, I really cannot see any great difficulty in following out this efficacious plan, it only requires any man of note in that profession to adopt it, and then all houses would quickly be rendered safe. Why could not the whole well of the staircase, its sides, ceiling, and flooring, be made of thin iron plates let into frames of the same metal; then again the stairs, balusters, hand-rails could be also constructed of that material, and here there would be great scope for ornamental castings. There is no doubt that the staircase forms the chief flue to a house when on fire, and as wood feeds the flame, so does the staircase the fire, allowing it to make its way into rooms leading on to the staircase, therefore I would suggest that all such doors should be of iron; they need not be heavy, the object being to keep the fire on one side only, and to prevent its spreading. I hope that some of your professional readers will take up this matter with spirit, for we must remember that the *staircase* is always the place first sought for when these accidents occur, and moreover we ought ever to bear in mind, that fires may and do take place in houses in which every possible care is taken to avoid its presence. *Gas, sparks, flues*, often being the primary causes of destruction of life and property by fire.

I am, Sir, &c.

June 23rd, 1845. P. A. T. H.

COST OF LOCOMOTIVE ENGINE.

Sir,—I should be obliged if any of your correspondents could inform me, through the medium of your columns, the cost of a three or four-horse power locomotive engine. It is proposed to be used for drawing loaded carriages down, and empty ones up, a line 1¼ mile in length. I presume a tender would not be necessary, as sufficient fuel might be kept in depôt at each end of the road. Also, what quantity of water (rather a scarce article) would be necessary for the supply of the boiler for that distance,

I am, Sir, &c.,

21st June, 1845. J. F.

FIRE-PROOF COMPOSITION.

Sir,—Is there not a patent for some material which if used instead of plaster will prevent houses from burning?

I am, Sir, &c., A. B.

PASSAGE OF WATER THROUGH PIPES.

Sir,—I wish to know the quantity of water that would be discharged through a pipe of one-inch bore per minute, the head of water being kept level with the top of the pipe, with the least force possible; and also what would be the increased discharge per minute, the head being raised from one to twelve inches.

I am, Sir, &c., F. E. H.

Miscellanea.

Waste of Straw in Thatching. — It would be impossible, after having entered so generally into all the various details connected with homesteads, to omit one most important consideration respecting them, I allude to the habit, too often in use, of thatching buildings. This cannot be too generally reprehended. The arguments against it are endless; it entails considerable expense, robs the land, creates danger from fire, is a harbour for vermin. Either of these objections is a sufficient reason for stopping this monstrous practice. If landlords reflect upon this, they will see that they ensure an injury to their land by compelling their tenants to repair with straw; whereas tiles or slates are preferable in every way. It is only the first outlay which is to be considered; by adopting which, robbery to the land and unceasing expense to the tenant are prevented. In the buildings lately pulled down at Peckham, there must have been nearly an acre of thatch, and they harboured vermin enough to stock a whole county. There are instances in the Weald of Kent, where nearly the whole straw of the tenant is used for his house and buildings, a fact lamentable in every view of the question. If straw is to be taken from the land, let it be sold, and the money laid out in artificial manure; but it is most desirable that it may soon cease to be used for such improper purposes.—*Lord Torrington.*

The use of Iron.—A correspondent of the *Mining Journal* in writing on the general utility of Iron says, "The immense destruction of property occasioned by fire, in most of our large manufacturing towns and cities, would be rendered less disastrous if warehouses and other depositories for merchandise, were constructed of iron, formed in different compartments and made secure. How lamentable it is to hear of the almost daily occurrence of some conflagration by which property to an immense amount is destroyed in this kingdom, when all public buildings would be more safe, as well as more durable, if constructed of iron, whilst the architectural beauty need not be diminished: the pointed spire, however ornamental, on all newly-erected or repaired churches, would be placed there with iron cheaper than any other material. The fame of our great statesmen and England's unconquerable heroes, might be perpetuated to the latest posterity in the erection of monuments constructed with iron, indeed the whole transactions of the British nation, in all her great mercantile pursuits, might be *recorded on iron*. I myself *have written upon paper manufactured from iron*, and seen a book, with both leaves and binding of the same material.

The relative Frequency of Phthisis in certain Trades and Professions.—Among those persons engaged in the different professions at Geneva, 114 fell victims to consumption out of 1,000. The average varies; in some professions it is higher than others; in the varnish painters it is as high as 37 in the 100, in the gardeners as low as 4. Among polishers, plasterers, sculptors, stone-cutters, watch-hand-makers, it reaches to 116 in the 1,000; and among the tailors, engravers, printers, clerks, &c. even to 141 in the 1,000. The average falls in carpenters, blacksmiths, slaters, and agriculturists, to 89 in the 1,000; in butchers, tanners, and candle-makers, to 73 in the 1,000; in weavers, dyers, bleachers, and watermen, to 53 in the 1,000; and in persons of easy circumstances it falls as low as 50 in 1,000. M. Lombard found that the age of the stone-cutter averaged 34 years, the sculptor 36, the miller 42, the painter 44, the joiner 49, the butcher 53, the lawyer 51, the surgeon 54, the mason 55, the gardener 60, the merchant 62, the Protestant clergyman 63, the magistrate 60.—*Hastings on Consumption.*

Printers' Almshouses.—A meeting was held last Monday evening, in the theatre of the Mechanics' Institution, of the friends and subscribers towards the building of almshouses for decayed printers. The chair was taken by Luke James Hansard, Esq., who not only ably advocated the cause of the association, but was announced as a subscriber of the liberal sum of 50*l*. The report, which was read by the secretary, proved in the most satisfactory manner that the object which the committee have so assiduously prosecuted for the last four years will ere long be fully realised, and another of those benevolent institutions be erected which reflect so much honor upon the working-men of the present day. The amount of subscriptions, &c., received since the last report was announced to be 355*l*. 2*s*. This added to the sum previously in hand makes a total of nearly 1,500*l*.

Singular Discovery of Lead Ore in America.—As Mr. Booth, who is an experienced miner, was sinking a shaft near Dubuque, through successive layers of hard sandstone, when about 25 feet from the surface he suddenly found himself in an immense cavern, which has since been ascertained to be 1000 feet in length, from 15 to 40 feet wide, and the height varying from 12 to 40 feet. In one place the roof almost reaches the floor, and divides the whole into two immense gloomy chambers, where, probably, Nature has been at work for an unimaginable series of ages. The strata is formed of stratified silicious limestone, with crystalisations and stalagmite hanging from the roof and sides. The principal portion of the lead ore contained in this cavern is found beneath the floor; small shafts have been sunk at intervals along its whole length, and the ore is found in detached masses, some probably weighing 1000 lbs., embedded in red silica, the total value of the deposit is said to be incalculable.—*Mining Journal.*

New Churches.—At a meeting held last week of the Society for promoting the enlargement, building, and repairing of Churches, it was determined to erect seven new churches, namely, in the districts of Portland town; in the district parish of Christ church, Marylebone; at Waterhead in the parish of Oldham, Lancashire; at Middleton, in the parish of Rothwell, near Leeds; at Clydach, in the parish of Llangyfilach, near Swansea; at Failsworth, in the parish of Manchester; at Wick, in the parish of Wick, and Abson, near Bristol, and in the district around Peter-street in the parish of St. John, Westminster. The churches which are to be rebuilt, enlarged, or otherwise altered, are the parish churches of East Ardsley, near Wakefield; Nettlebed, near Henley-on-Thames; Beeford, near Driffield; Sandford, near Woodstock; Stert, near Devizes; and the Chapel of North End, Fulham.

Flooring for Pigsties.—At a late meeting of the Agricultural Association, in answer to an inquiry as to the best mode of laying down an asphaltic or bituminous flooring in pigsties, Mr. Parkins informed the Council that he had found the following composition very useful for that purpose, namely, lime or pounded chalk mixed with so much coal-tar from gas-works as will leave the mixture in a state not too soft for ramming, adding a sufficient quantity of sand or fine gravel to bind the whole. Mr. Parkins stated that these materials not only formed a hard basis for pigsties, farm-yards, &c., but made good walks, on which weeds would not grow, and answered the purposes generally for which asphalte was commonly employed.

German Hospital in London. — An attempt is being made to establish a German hospital in London, and from the patronage and support it has already received there appears to be no doubt of its success. A public meeting has been held, at which the Duke of Cambridge presided, supported by several of the foreign ministers, &c. The sum of 5,000*l*. will be required for the establishment of the institution, and the needful annual expenditure will amount to 1,200*l*. or 1,500*l*. Already upwards of 3,000*l*. have been subscribed.

Pine Logs.—Dr. Bowring last week moved in the House of Commons that the duty on pine logs not exceeding 10 feet long and 11 inches square be reduced to 12*s*. 6*d*. a load. Sir G. Clerk opposed the motion, and it was withdrawn.

A NEW GLASS.—Styrole is a volatile oil, obtained by distilling the balsam styrax or storax, although only in small quantity, and has a general analogy to benzoin. In one property styrole is, perhaps, the most extraordinary of substances; a limpid fluid at ordinary temperatures, it becomes a transparent colourless glass when heated up to a certain point, and remains so when it again becomes cool—a circumstance which will draw the attention of optical inquirers to styrole. In distilling storax to obtain this liquid, 20 parts of storax are mixed with 7 parts of carbonate of soda and water put into the retort. In one experiment, 41 pounds of balsam yielded 12 ounces of styrole; in another, 27 pounds yielded 3 ounces. The fresher and softer the storax, the more productive is it of styrole.—*Mechanics' Magazine.*

THE ARCH KNOWN TO THE GREEKS.—Mr. Page has lately presented to the Institution of Civil Engineers sketches made by himself of two arches at Cape Crio (Cnidus, Rhodes). These arches are semicircular, built of large stones, regularly radiating from a centre, without any mortar in the joints, and stand among Cyclopæan remains, of which they apparently form a part. He is of opinion that the Greeks were aware of the properties of the arch. They evidently appreciated its form, for it must have been noticed by all travellers how frequently the flat lintels are cut out on the under side; several specimens of this exist in the sepulchral remains now in the British Museum. At Athens he has noticed a very considerable excavation of a regular arched form through solid marble.

PLANK ROADS IN CANADA.—The experiment of planking public roads has been successful in an eminent degree in Canada. One between London and Port Stanley, 30 miles long, is already finished, and another now constructing between Port Dover and Hamilton, 50 miles long, and a third between London and Hamilton, 80 miles in extent, are now under contract. They are laid for double and single tracks, the expense of the former being 4,000 dollars, and the latter at 3,000 dollars per mile. The roads already constructed are expected to last ten years.

VENTILATION OF COMMONS' COMMITTEE ROOMS.—It is surprising that members can be found to subject themselves to the evils resulting from the want of ventilation in the present committee rooms. As one honourable member observed to us lately, if a workhouse could be found as ill ventilated as these rooms are, the journals would blazon it all over England, and force an improvement.

THE ROYAL RESIDENCE AT COWES.—The first stone of the new building about to be erected at Osborne House was laid on Monday last by her Majesty and the Prince of Wales.

WORKS OF FINE ART IN WESTMINSTER HALL.—This exhibition will be opened to the pubtic on Monday next. There is a private view to-day, Saturday.

NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For the execution of a New Harbour at Greenock.

For the construction of Two Divisions of the Chester and Holyhead Railway, being Nos. 8 and 12. No. 8 contains a length of 7 miles and 54 chains. No. 12 contains a length of 5 miles and 26 chains.

For excavating and levelling Land, building Sewers, making a new Road, &c., on the Wheatley Estate, Erith, Kent.

For lowering and making certain Improvements at the Euston Hill, Henstridge, Somerset.

For the Removal of several Wrecks in the Thames.

For the Erection of a New Church in the parish of Whitechapel.

For the Erection of Schools and a Teacher's Residence in connection with the new church of St. Jude, Whitechapel.

For the Repairs to the South Aisle, Roof, &c., of St. James's Church, Bury, St. Edmunds.

For the Erection of New Schools at Great Chesterford, Essex.

For the supply of 2,500 Yards run of flat Granite Curbing for the Parish of St. John, Hackney.

For some additions to the House of Industry at Norwood.

For the supply and erection of a Steam Cooking Apparatus at the New Workhouse at Cuckfield. To be capable of cooking food for 450 inmates, and providing Hot and Cold Water in the Scullery, Bath-rooms, and Wash-house, with a Closet for drying linen.

For furnishing and fixing an Engine Pump at the Sevenoaks Union.

For Paving certain of the Foot-paths of the Parish of St. John, Hackney.

For Building the intended Somerset Lunatic Asylum. (Time extended).

For taking down and removing the House, Outbuilding, and Offices, erected by the Rev. W. H. Gorton, in a field at Portisham, Dorchester, and rebuilding the same on the glebe land adjoining the Church-yard there.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

In the parishes of Terling and Fairsted, Essex: 215 Capital Oak, and 11 Ash Timber Trees, many of them of large dimensions.

At Norton Hall, and Purleigh Round Bush Farms, Essex: an assortment of Oak, Ash, and Elm Timbers and Whips.

At the Crown and Anchor Inn, Ipswich: the Martello Tower, situated on the point of Bawdsey, Suffolk. The materials arising therefrom could at a trifling expense be conveyed to any part of the kingdom.

At Dinton Park, and Lutton Mandeville, Wilts: 93 capital Oak Trees, some of large dimensions, 250 Oak Flitterns, 200 Ash and other Poles, &c.

In Shirley Park, near Croydon: 2,000 straight Poles, and 8,000 Bavins, Fir, Oak, Elm, Chesnut, and Alder, but principally Larch of 35 years' growth.

At Sibley's Farm, Chinckney, Essex: 40 fine Oak, 47 large Elm, and 50 Ash Timber Trees. Most of the trees are of large dimensions and good quality.

At Blois Farm, Sible Hedingham: about 800 Oak Trees.

At Fyfield Farm, near Pewsey, Wilts: 60 Oaks, 111 Elms, and 103 Ash and Abeles. They are of extraordinary dimensions and fine quality.

CHARGE FOR ADVERTISEMENTS IN "THE BUILDER."

	£.	s.	d.
For Sixty Words or less	0	5	0
Every additional Thirty Words	0	1	0
One Column	2	2	0
One entire Page	5	5	0
To workmen advertising for situations, the price will be reduced to	0	3	6

For a series of advertisements above 5s. a reduction will be made.

Advertisements forwarded from the country for insertion *must* be accompanied with a post-office order, according to the above scale.

Volume I., containing upwards of THREE HUNDRED ILLUSTRATIONS, elegantly bound in cloth, price 15s., and Volume II. containing upwards of FOUR HUNDRED ILLUSTRATIONS, price 17s. 6d. can still be had of all booksellers.

TO CORRESPONDENTS.

"B. A."—*Mr. Eastlake's letter to Sir R. Peel, on National Gallery, may be obtained at Mr. Murray's, Albemarle-street.*

"A Constant Reader."—*As to river wall, we should use Roman cement.*

"B. Green."—*We have received the communication, but have not had time to examine it. We will give it most kindly consideration.*

"Bedroom Ventilation."—*In answer to our correspondent last week, "A Mason," we beg to direct his attention to an advertisement of "Baillie's Patent Slide Ventilator;" recommended by Mr. Reid, brother to Dr. Reid, as the one for which probably he was making inquiry.*

"W. J. S."—*We are not disposed to publish the sketches sent. They are left at the office, with our thanks.*

"A. B."—*Bernan's History and Art of Ventilating gives much valuable information.*

"Mon. F."—*We are fully disposed to entertain the proposition, and will write shortly.*

"Philo-Alpha."—*Received.*

"F. T."—*Received, but not yet read. Our correspondent shall hear from us.*

"Inexperience."—*Renew the weather-boarding a piece at a time. An external enclosure may be at all times* repaired *with materials of the same sort as those of which the enclosure has been built—schedule D, part II.*

Received: "B. B." "H. T." "*Humanitas*," "*A Constant Reader*," "*W. G. Pinkey*," "*Bunnett and Corpe.*"

ADVERTISEMENTS.

Just published, price 4s., neatly bound in roan, with tuck, gilt edges, and lettered, a Pocket Edition of

A CYCLOPÆDIA of the NEW METROPOLITAN BUILDINGS ACT, together with the Act itself, a Folio Table of the Metropolitan Districts (old and new), a List of the Surveyors, with their Residences and Offices, and a Table of Fees to be paid to the Registrar for services performed.

In the Cyclopædia all the details of the Statute are arranged Alphabetically, so as to be instantly found, and accompanied by extensive references and counter-references to the sections of the Act itself and its minute provisions. By the late A. BARTHOLOMEW, Esq., F.S.A., Architect, Surveyor of the Hornsey District.

Published at the Office of "The Builder," 2, York-street, Covent-garden; and to be had of all Booksellers.

ROYAL POLYTECHNIC INSTITUTION.—A WORKING MODEL of the ATMOSPHERIC RAILWAY, capable of carrying visitors, is lectured on and exhibited daily, and also in the evenings. During the week Dr. Ryan will lecture daily at a quarter past Three, and on the Evenings of Monday, Wednesday, and Friday at Nine, on the causes of STEAM-BOILER EXPLOSIONS; and especially those arising from incrustation, with the means of prevention. Among the Novelties recently introduced is a full-sized Cast from the CENOTAPH of GALEN, in which the PORTLAND VASE was found; a curious MECHANICAL HAND; new and beautiful Objects in the Chromatrope, Phisioscope, Proteoscope, &c. New Dissolving Views; Submarine Experiments by the Diver and Diving-Bell; Working Models described daily. Admission, One Shilling; Schools, half-price. A Class for instruction in Mathematics is about to be formed under the direction of Mr. A. W. Hobson, B.A., of St. John's College, Cambridge.

NOTICE TO INVENTORS.

OFFICE FOR PATENTS OF INVENTIONS and REGISTRATIONS of DESIGNS, 14, Lincoln's-inn-fields.—The printed INSTRUCTIONS gratis, and every information upon the subject of PROTECTION for INVENTIONS, either by Letters Patent or the Design Acts, may be had by applying personally, or by letter, prepaid, to Mr. ALEXANDER PRINCE, at the office, 14, Lincoln's-inn-fields.

PRIZES IMPORTANT TO INVENTORS AND PATENTEES.

A GOLD MEDAL, value 100*l.* and a SILVER MEDAL, value 50*l.*, will be given by Mr. M. JOSCELIN COOKE. The Gold medal for the best Patent, and the Silver medal for the best Design taken out or Registered at the OFFICE for PATENTS and DESIGNS, 20, Half-Moon-street, between the 1st of November, 1844, and the 1st of June, 1846. The Prizes will be awarded by competent judges on the 10th June, 1846. The conditions to be observed, together with instructions, charges, and every information for obtaining Patents in England or Foreign Countries, or Registering Designs, will be forwarded gratis, on application to Mr. M. JOSCELIN COOKE, at the Office for Patents and Registration of Designs, 20, Half-Moon-street, Piccadilly, London.

VARNISH.—It has long been a desideratum amongst the consumers of Varnish to obtain a good and genuine article; brilliancy, facility of drying, hardness, and durability are the qualifications necessary, but these are seldom if ever found united. The experience of a life-time devoted exclusively to the manufacture of this article, the great and important discoveries of modern chemistry, and the daily improvements in machinery, have enabled Messrs. George and Thomas Wallis to produce Varnishes (both oil and spirit) unrivalled in every respect, and they confidently recommend them to the trade, as deserving of notice both in price and quality.

Builders, Coachmakers, Painters, and others may depend on being supplied with a genuine and unadulterated article. Fine Oil Varnish, from 10s. per gallon; best White Spirit Varnish, 21s. ditto; Best Spirit French Polish, 20s. ditto; White Lead, Oil, Turps, and Colours of every description at the very lowest prices.—WALLIS'S Varnish, Japan, and Colour Manufactory, 64, Long-acre, one door from Bow-street. Established 1750.

WALLIS'S PATENT LIQUID WOOD KNOTTING.—This newly-discovered Liquid Composition which Messrs. Geo. and Thos. Wallis have the satisfaction of introducing to the trade, possesses the important qualification of effectually stopping Knots in Wood, however bad, and preventing them eating through and disfiguring the paint above.

Many substances have been used and much time spent in endeavouring to find a cure for a bad Knot, but hitherto without success. Messrs. Wallis therefore feel much pleasure in offering to the public an article so long and anxiously called for.

In the application, skill is not required; a boy can use it as well and effectually as the best workmen: it is put on to the work with a brush like common paint, can be used in all climates and situations, and does not require heat.

Sold wholesale and retail, by Messrs. G. and T. Wallis, Varnish, Japan, and Colour Manufacturers, No. 64, Long Acre. Price 20s. per gallon.

STUCCO FRONTED HOUSES THAT WANT PAINTING.—The only Paint expressly invented and adapted for this purpose is—JOHNS and Co.'s PATENT STONE COLOUR STUCCO PAINT: it is far better for Stucco Work than White Lead—is much more durable and less costly—its colour is that of pure Bath Stone. MANN and Co., Agents for the Patentees, 5, Maiden-lane, Queen-street, Cheapside.

THE PROJECTED RAILWAYS.

ANALYSIS of the PATENT METALLIC SAND, or English Pozzolano, used in the foundations of the New Houses of Parliament, the great Tunnels on the Birmingham Railway, Sea-wall on the Great Western Railway in Devonshire, and other important works referred to more particularly in the prospectus.

Silica	49	Lime	6
Oxide of Iron	32	Magnesia	2
Alumina	6	Zinc	3

Arsenic and Carbonate of Copper 2

Price in Swansea, free on board, 6d. per bushel, or supplied in London at 1s. per bushel.

Used as an external Stucco the Metallic Sand Cement is unaffected by frost or wet; in appearance it resembles the best Portland Stone, requires neither colour nor paint, and is entirely free from vegetative cracks and blisters.—Further Particulars on application to Mr. C. K. DYER, 4, New Broad-street, London; and at the Metallic Sand Wharf, King's-road (opposite Pratt-street), Camden Town.